The Origins of Legislative Jurisdictions: Petitions and Standing Committee Formation in Revolutionary Virginia and the Early U.S. House*

Tobias Resch† Benjamin Schneer‡ Maggie McKinley§ Daniel Carpenter¶

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Abstract

Committee formation in the early state legislatures and the antebellum Congress coincided with the largest surge in petitioning in American history, yet the clear historical relationship remains unexamined in institutional political science. We develop a model of committee formation where the key input is the inflow of petitions (citizen complaints and requests) across a variety of topics. The floor of the legislature is uninformed about the petitions yet incurs penalties if it fails to respond to them. Given other methods of responding to petitions (select committees, processing them on the Floor, referring them to members as ombudsmen), the floor creates committees to process petitions only when asset specificity of the information combines with political generality. Under the Floor's optimal policy, the probability of new committees forming is related positively to the frequency of petitions on a given topic (but not necessarily to petitions overall). We test these and other propositions by harvesting two original datasets – one covering all legislative petitions to the Virginia House of Delegates from 1776 to 1789, the second covering over 100,000 petitions recorded in the House Journal from 1789 to 1875, combined with data on their introduction and referral to select and standing committees. Empirical analyses demonstrate that early American legislatures created committees when topic-specific petitions increased, and particularly when the entropy of petitions across constituencies was higher. Attention to an important, precedent-setting case – the Virginia Committee on Religion of 1776 – demonstrates the role of topic specificity and geographic generality. Our theory and empirical analysis point to the manifold nature of asset specificity in policy information, give new meaning to the entropy of political agendas, and help reinterpret the origins of standing committees in American legislatures.

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†Ph.D. Candidate, Harvard University. resch@fas.harvard.edu.

‡Assistant Professor, Florida State University. bschneer@fsu.edu.

§Climenko Fellow, Harvard Law School. mmmckinley@law.harvard.edu.

¶Freed Professor of Government, Harvard University. dcarpenter@gov.harvard.edu.

1 Introduction: The Problem of Committee System Formation

Modern legislatures perform much of their work through committees. Lawmaking bodies rely upon complex committee structures that refer policy details to a network of topic-focused sub-organizations. Standing committees in these systems often number in the dozens, and the committees have rough jurisdiction over the different policy topics in their domain (defense, agriculture, justice and courts, etc.), while also often competing over jurisdictions (King 1997).

There are few questions more central to institutional political science than that of how committees work, and yet two dynamics about their emergence have eluded much of the discipline's purview.

The first is that legislative committees are very old, indeed much older than the stylized facts that underlie their theorization. The theory of legislative committees, like that of Congress more generally, is premised largely upon developments in the post-Civil-War United States. Weingast and Marshall (1988), along with Shepsle and Weingast (1987), discuss committees as mechanisms for facilitating the logrolling contracts that support distributive politics in legislatures, and their work stems in part from the abundant discretionary spending of the twentieth-century Congress. Gilligan and Krehbiel (1987) and Krehbiel (1992) theorize committees as investigative mechanisms to reduce policy uncertainty, and these scholars use as motivating examples the emergence of restrictive amendment procedures in the late-nineteenth-century United States. Well-known party control arguments about committees see them as tools of the majority party's "procedural cartel"; the emergence of a strong partisan leadership comes deep into the nineteenth century (Jenkins and Stewart 2012; Gamm and Smith 2002). Epstein and O'Halloran (1999) focus largely on executive delegation, but argue as well that committee systems can be seen as mechanisms for executive and administrative oversight. Yet whatever the logic of committee politics – distributive, informational, partisan or oversight – these theories take the conditions under which committees are created and operate as relatively recent, or at least after the U.S. Civil War.

Committee systems are plausibly much older than these conditions – older than mass parties, older than technocratic policy, older than modern logrolling, older than most of the administrative

state.[1] Committees were common in the legislatures of the revolutionary states (Squire 2012) before they had disciplined parties. Committee systems were created quickly after the Constitution in the U.S. House (Gamm and Shepsle 1989; Cooper 1970), at about the time legislative parties emerged but well before mass parties did. By virtually any accounting, legislative committees predate mass distributive spending and logrolls of the nineteenth-century Congress, the technocratic policy space that undergirds informational theories, the emergence of disciplined parties in the Jacksonian period that underlies procedural cartel theory, or the development of the post-Civil War, Progressive-Era national administrative state apparatus (Skowronek 1982; Bensel 1990; Carpenter 2001) that underlies oversight theory. Indeed, standing committees are *much* older than this. The English Parliament had a developing committee system in the sixteenth-century, and American colonial legislatures such as the House of Burgesses had developed standing committee systems well before the American Revolution.

The second issue is that much of the theory devoted to committees in political science examines committees already created, setting aside the question of where committee systems came from. In informational theory, the decision to "make or buy" legislation – to "make" it on the Floor or to "buy" it from committees – presumes that there exists a well-informed sub-organization *to* which the floor can turn for expertise, *with* which the floor can strike up a contract of some sort, *from* which the floor can "purchase" policy. Similarly, much of the procedural cartel theory takes committees for granted; it does not discuss where committees came from. A historical and theoretical literature examines the development of standing committee systems in the House (Gamm and Shepsle 1989; Cooper 1970), yet it does not examine why some committees were created before others. Scholarship on the evolution of congressional committee jurisdictions focuses almost entirely on the twentieth

[1]Depending of course on how one defines the "origins" of these entities, this statement is contestable. Some aspects of the administrative state such as postal systems, military and treasuries are far older than any committee systems, and distributive politics is probably as old as politics itself. But considering the emergence of modern mass parties (the Jacksonian period), the administrative state stemming from the Civil War and Progressive Era (Skowronek 1982; Bensel 1990), and the dependence of distributive politics on broad-based revenue systems such as the income tax, the statement has basic plausibility.

century (King 1997; Baumgartner, Jones, and MacLeod 2000; Baumgartner and Jones 2015). Given the acknowledged importance of "layering" – of the force of previous legislative institutions in the evolution of new legislative institutions (Gamm and Shepsle 1989; Schickler 2001) – examining the origins of American standing committees both theoretically and empirically seems critical.

The present study focuses upon the early United States, and it rests upon a simple fact: *American legislatures built their committee systems at a period when they were being inundated by petitions.* From the American Revolution through the U.S. Civil War, petitioning was surging across nearly every sector of American society – rich and poor, black and white, voters and non-voters, women and men, native Americans and European settlers. Dealing with these petitions occupied an immense amount of the time of these legislatures – often entire days of legislative proceedings – and petitions vastly outnumbered bills (McKinley 2016; Carpenter and Moore 2014; Carpenter and Schneer 2015; Carpenter 2016).

We document this fact and use it to build a model of committee system creation and "committee placement" in policy space. The model is decision-theoretic and leaves a number of important issues and dynamics to future theorization efforts, but it renders predictions about important variables: the number of committees created, the timing of committee creation, the topics on which committees will be created, the placement of those committees relative to one another in a space of information and expertise, appointments to these committees, and other dynamics. It allows scholars and students of committees to pose and address critical questions about the emergence of legislative committee systems.

- Why did committee systems emerge during surges of petitioning and not before, not after?
- Why do committee jurisdictions subsume policy topics and not, say, geographic constituencies?
- Why do some policy topics receive committees, while others do not? Or, why are committees created for some policy domains *before* being created for others?
- Why are petitions and bills not left to the members from whose constituencies they emerge? Put differently, why are petitions not left to individual legislators to deal with in their roles as ombudsmen?

The model embeds a simple political reality that was all too well understood by early American elites; failure to respond to petitions was associated with electoral losses, with citizen discontent that could spiral and diffuse, with political turbulence, and even with armed revolt. Thomas Jefferson's Declaration of Independence decried the failure of the Crown to answer American colonists' petitions. The right of petition was cherished (McKinley 2016), and the First Congress enshrined it in the First Amendment to the Constitution. Petitions could be used to organize against elites, even (indeed especially) when elites were not paying attention to them (Carpenter and Schneer 2015; Carpenter 2016). The linkages between petitioning and legislative development are, indeed, much older and probably extend to the late medieval period. Two important studies examine these developments in fourteenth-century France and England (Petit-Renaud (2001, p.281-301); Maddicott (2010, p. 352-375)).

Representing petitions as a set of incoming demands, for which the failure to answer imposes losses upon the legislature, we analyze the decision of the floor to create petitions on a "topic circle" as opposed to dealing with the petitions themselves or leaving the petitions to individual members. We then draw upon two original datasets – petitions sent to the Virginia House of Delegates in 1776, and all petitions recorded in the House Journal from 1789 to 1870 – to examine whether and how petitioning predicts the development of legislative committees in Virginia and the United States. Analysis of the first session of Virginia's House of Delegates shows that committees were created for those topics where petitions were most common, and most spread across constituencies. As a demonstration of how vital the link between petitioning and committee formation could be, we include a brief case study of how religious petitions induced the Virginia House of Delegates to create an original "Committee on Religion" that served as the drafting shop for Virginia's famous statute on religious freedom. We then turn to the U.S. House, and demonstrate that petitions predict standing committee creation. We include a second brief case study of how the split of the Commitee of Commerce and Manufactures into two separate committees at the beginning of the 16th Congress coincided with a surge in manufacturing-related petitions. We conclude by outlining the importance of petitioning and legislative development as a critical dynamic for political scientists, legal scholars, historians and other social scientists, and discuss extensions to both the model and the empirics.

2 A Brief Portrait of the Ubiquity of Petitioning in Colonial and Early American Legislatures

Early legislatures in North America were not much professionalized and met only occasionally, depending heavily upon geography (Squire 2012). When they did meet, however, most of their business was determined by incoming petitions. Table 1 displays the calculations of colonial Virginia historian Edmund Bailey, who demonstrates that half or more of all bills passed by the Virginia House of Burgesses came from petitions. Elsewhere, colonial legislatures that had standing committees often created one or more (composing from a quarter to the entirety of their standing committee systems) just for the receipt and disposition of petitions (Table 2).

Table 1 – Legislative Enactment Deriving from Petitions, Virginia House of Burgesses, 1690s–1790s

	1696	1710	1730	1752	1769-70	1790
Laws originating from petitions	9	5	17	24	49	56
Total number of laws passed	14	17	29	53	89	99
% of laws from petitions	64%	29%	59%	45%	55%	56%

Table 2 – Committee-Based Standing Committees in Colonial Legislatures, circa 1770 (Squire 2012)

Colonial Assembly	Committees Devoted to Petitions	Total Committees
Connecticut	None	0
Delaware	Aggrievances	2
Georgia	Grievances	2
Maryland	Grievances and Courts of Justice	3
Massachusetts	Petitions as may be Brought In, praying for Liberty to Make Sale of Lands	1
New Hampshire	None	0
New Jersey	None	0
New York	None	2
North Carolina	Propositions and Grievances; Public Claims	4
Pennsylvania	Aggrievances	4
Rhode Island	None	0
South Carolina	Grievances	4
Virginia	Propositions and Grievances; Public Claims	6

In the early U.S. House, entire days of legislative proceedings are taken up with the reading, assignment and disposition of petitions. Calculations from our data show that petitions far outnumber bills during this time period, and from the 1810s through the 1830s outnumber bills and recorded roll-call votes by favors of four-to-one to eight-to-one or more. To be sure, much of legislative business during this period was conducted *viva voce*, but a glimpse at any sequence of days from the early legislative journals will reveal how much more time was spent on the adjudication of petitions than upon aggregation of voices or votes. Because many bills originated from petitions, moreover, the estimates presented in Table 3 likely underrepresent substantially the space and time taken up by petitions as opposed to bills.

Table 3 – Petitions and Bill Introductions in the Early U.S. House

Congress	Petitions	Bills Introduced
5th (1797–1799)	328	178 (155 roll calls)
10th (1807–18090)	495	173 (237)
15th (1817–1819)	1263	331 (106)
20th (1827–1829)	2067	462 (233)
25th (1837–1839)	7890	1176 (475)

A glimpse of how petitioners followed their petitions through the legislature may be found from a petition sent by the residents of Indiana Territory (then governed by William Henry Harrison, the future president) to the House and Senate in September 1814. In that petition, the memorialists remind the House and Senate that they have been tracking the process of previous petitions. In the midst of the War of 1812, with the Great Lakes Midwest and the "Old Northwest" highly contested territory, the alliances and fidelities of these settlers would have been important bar beyond the value of their votes.

> Also your Memorialists will further represent that the memorial of the Legislature of the Territory at their Session in the winter of the present year as far as your memorialists have learned was referred to a committee appointed by the House of Representatives in Congress who reporting among other things, that the Memorialists did not designate the particular companies of militia, and failing therein the committee could not say whether the companies of militia had been paid or not; your Memorialists therefore request that a call be made on the Secretary of War, and it will be founded that the

muster rolls, have been made for these companies, or some of them, & deposited in the office, both the Muster Rolls going into the service and out of Service, which will designate those companies specially.[2]

In short, the following general patterns characterize early American legislatures.

- petitions dominated early American legislation, composing the basis for half or more of the bills passed
- colonial legislatures set up a range of committees devoted entirely to petition receipt and disposition alone
- in early national America, petitions far outnumbered bills and roll-call votes
- legislators knew that constituents followed the legislative disposition of petitions

We now use these patterns as the basis for a formal model of petition receipt and committee formation by a rational Floor.

3 Model

3.1 Agenda-Setting: Petitions from Point Processes on a Topic Circle

In a two-dimensional space of information $(x, y) \in \Re^2$ let ϕ be the location of the legislature's floor, which is fixed at the beginning of play by the knowledge of the Floor's pivotal decision maker (say the floor's median voter). A legislature with odd-numbered, single-member district membership receives petitions from a set of generators (topics τ) that are represented by point processes on a circle. The formula for the *topic circle* is given by

$$x_\tau^2 + y_\tau^2 = r_\tau^2 \tag{1}$$

The dimensionality of the circle represents two features – *general knowledge obtained by inspection* and *specific knowledge obtained by experience* – of the informational context facing a legislature.

[2]Memorial of the Legislature of the Indiana Territory to the Senate and House of Representatives, September 10, 1814; William Henry Harrison Papers, Box 2, Folder 13; Indiana Historical Society;

The distance of the topic circle from the floor represents the "general ignorance" of the floor about the topics that come before it. It reflects the value of informed but not specialized knowledge, what a generalist could learn from looking into a problem, such that the knowledge represents an inspection good. Yet the topics that come before the legislature are also characterized by informational specificity. Creating specialized knowledge of one sort (on agriculture) may or may not translate into specialized knowledge of another sort (on military policy); investments in knowledge have *asset specificity*, such that expertise has properties of an experience good. The advantage of a circular representation – or the half-circle, which is basically equivalent – is that generalized knowledge and knowledge specificity are parametrically related to one another, and both are larger for a topic array with greater "spread" or "diffusion" (larger r_τ).[3] They are not, however, identical. The floor may be generally uninformed about a range of complex topics, but perhaps two of those topics are sufficiently closely related to one another ("close" on the topic circle) that investment in one committee will give the floor sufficient information about both. In contrast, two topics that are quite different from one another (distant from each other on the topic circle) may require two separate committees, however well or poorly informed the floor may be.

The model thus embeds not only the idea of *asset specificity* in policy information (petitions) but the more particular point that specificity is always relative, that is, defined by the differential capacities and knowledge of two or more agents in a relational framework.[4] In a world with one floor and one committee, there is simply information asymmetry, not asset specificity more generally. Our model will provide a framework for examining multi-committee systems with plural jurisdictions.

[3]To be sure, one could in theory use a linear representation of general versus specific knowledge/ignorance. The advantage of the circular topic array is that it permits a simple representation of the case in which the Floor is symmetrically uninformed about all topics.

[4]The topic circle is of course a simpler representation of these relativities, and one can imagine a multi-dimensional representation using other formal techniques.

3.2 Petition Generators as Poisson Processes on the Topic Circle

For the present model, we adopt a Poisson process description of the topic point process.[5]

For a given interval of elapsed time $t = (t' - t_0) > 0$, the number of petitions generated from a topic τ_i is given by

$$\Pr\{N(t_0, t'] = n\} = \frac{[\lambda^{\tau_i}(t' - t_0)]^n}{n!} e^{-\lambda^{\tau_i}(t'-t_0)} \tag{2}$$

Because the variance of a Poisson process is identical to its mean, the import of informational losses incurred by the legislature relative to the topic has two equivalent interpretations. First, it may be the direct informational losses incurred from a set of petitions, where the losses are a linear function of the number of petitions associated with that topic. Second, it may be losses incurred from uncertainty over the number of petitions and citizen demands coming from that topic, where the losses are strictly increasing in the level of this uncertainty. Similarly, if first-order and second-order (uncertainty) losses are linear and separable, then the Poisson process permits an easy description of such a function as a linear, additive function of Poisson mean and Poisson variance.

3.3 Sequence of Events

Stage 1 From a uniform distribution on the topic circle,[6] Nature generates a denumerable set N_τ of topic generators $(1, 2, ...\tau, ..., N_\tau)$ on the circle of radius r, each at point (x_1^τ, y_1^τ), (x_2^τ, y_2^τ), and so on.[7]

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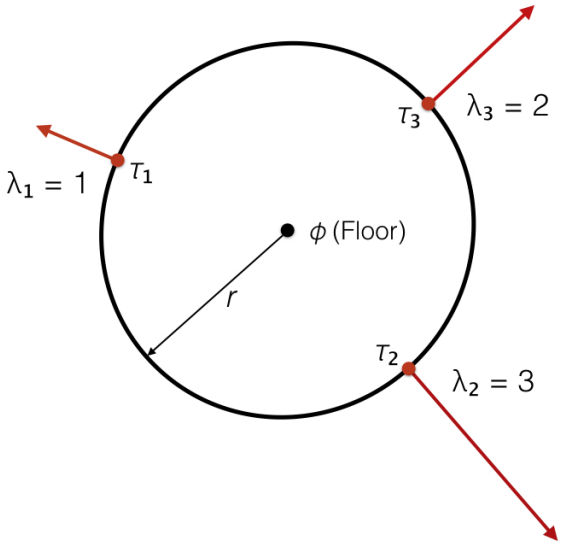
[5]We are aware that other stochastic process representations are possible. We think, however, that eventual endogenizing of the petition process with committee existence will initially make progress with a one-parameter, homogenous representation.

[6]This is the distribution which assigns each point on the circle as uniform over the angles θ between 0 and 2π. Then for any arc between points (x_1, y_1) and (x_2, y_2) the probability of a topic generator being assigned to a point within that arc is $\frac{\theta(x_1,y_1)(x_2,y_2)}{2\pi}$, where θ $(0 < \theta < 2\pi)$ is the angle of the rays connecting the topic points to the topic circle's center.

[7]The assumption of continuity of x and y, along with the uniform distribution, guarantees that the event of exact *equidistance* between any two or more topic generators has negligible $(\epsilon \to 0)$

Figure 1 – Topic Circle



Each topic generator point has a concomitant point process – here a Poisson process which is homogeneous – which generates petitions. Each Poisson process is associated with a parameter λ_τ ($\lambda_\tau > 0$), which is generated by a Gamma distribution with strictly positive mean. So we can think of the legislature arriving to its very first session, before which petitions have already come in to the legislature (the previous 6 months, say), at the end of which there are 5 petitions on one topic, 15 on another, 0 on another, and so on.

Stage 2 Knowing the posterior mean of the count distribution for each topic generator on the circle ($= \hat{\lambda}(\tau_i)$), the floor creates a set of committees at points (x_1^c, y_1^c), (x_2^c, y_2^c), and so on, and assigns the petitions accordingly to these committees, keeping a fraction to itself for resolution by floor debate, and delegating a fraction to each committees it has just created.

The model at present lacks a sequential structure, which we will impart to it in further work. Ideally, one would want at least two allocations of committees to topic-revealing petitions, a first in which the floor creates one set of committees based on "priors" and a second allocation based upon "posteriors." In such a design, the first formation stage is committee creation *ex nihilo* or (more

probability. This is important in assuring uniqueness of the floor's optimal strategies for committee placement.

properly) *de novo*, whereas the second stage would take account of the committee structure created in the first stage. An important property of such a model would be the "option value" attendant upon the Floor's valuation of committees in any first stage, given the possibility that reversing an allocation might be costly.[8]

The expertise of the floor (ability of the floor to deal with these petitions) is a negative/inverse function of the radius of the circle (r) (distance from the center (the floor) to any of the point processes). For purposes of the present paper, we set $\phi = (0, 0)$ without loss of generality.

If committees are created, they occupy a point on the circle, and the committees' expertise for any given topic's petition is a negative function of the distance separating the jth committee point and the ith petition generator point (τ_i, c_j). Specifically, per-petition expertise losses are a monotonic function of arc length α, where $\alpha = \pi r_\tau(\frac{\theta(\tau_i, c_j)}{180})$, where θ (expressed in radians) is the angle $(0 \leq \theta \leq 180)$ created by the two rays connecting the center to the two points on the circle $(x_i^\tau, y_i^\tau), (x_j^c, y_j^c)$.

For purposes of analysis, an important quantity will be the smallest distance,[9] for each topic generator, from that generator point (weighted by its petition intensity) to the "nearest, best-informed" committee

$$\delta_i^\tau = \inf_{c \in \mathcal{C}} \hat{\lambda}_i^\tau \times d[(x_i^\tau, y_i^\tau), (x_j^c, y_j^c)] = \inf \hat{\lambda}_i^\tau \alpha(\tau_i, c_j) \tag{3}$$

The floor disposes of the petitions by rule of the median voter. It can either handle them alone, with expertise losses as a monotonic function of r, or it can assign them to an existing committee, with expertise losses given by d, or can create a new committee to minimize distance

[8] In a strategic model, the Floor would want to think about the difficulty of reversing allocations of petitions and topics to committees made in the first stage, subject to whatever incentives (effort, ideological policy) governed the committees. Among the many difficulties such a model will confront is that the number of players in such a game is endogenous.

[9] Among the many reasons for using the infimum operator as opposed to the minimum is that for the Poisson process, $\lambda_i \in (0, \infty]$, with $\mathcal{E}[\lambda_i] < \infty \forall i$. Hence $\inf \lambda_i$ always exists and inf always exists for monotonic functionals of λ, whereas the min may not.

losses. (This will be a sum of distance losses from petitions not taken up by either the floor or by other committees).

3.4 Optimal Committee Creation and Placement by the Floor

Given an observed set of topic generators – τ_1 at point (x_1^τ, y_1^τ) with petition-generating mean $\hat{\lambda}_1^\tau$, τ_2 at point (x_2^τ, y_2^τ) with petition-generating mean $\hat{\lambda}_2^\tau$, through τ_N at point (x_N^τ, y_N^τ) with petition-generating mean $\hat{\lambda}_N^\tau$ – the Floor can calculate the expected value of creating and placing a single committee, then the expected value of creating and placing two committees, and so on. Let the cost of each committee created be either k_c (*constant committee cost*) or $k_c(N_c)$ (*convex committee cost*), where both costs and their rate of change are strictly non-decreasing in the number of committees.

Let the value of a single committee system be V_1^c. The committee is placed at $(x_1^{c^*}, y_1^{c^*})$, where these satisfy

$$\inf_{c\in\mathcal{C}} \sum_{\tau=1}^{N_\tau} \hat{\lambda}_i^\tau d[(x_i^\tau, y_i^\tau), (x_1^c, y_1^c)] = \inf \sum_{\tau=1}^{N_\tau} \hat{\lambda}_i^\tau \alpha(\tau_i, c_1) \tag{4}$$

The Floor divides the petitions into two sets, those referred to itself (Committee of the Whole) and those referred to standing committee. Petitions from topic generator τ_i are discussed in the Committee of the Whole (or floor) ($i \in \mathcal{W}$) if $\alpha(\tau_i, c_1) > r_\tau$ and assigned to the single committee ($i \in \mathcal{C}$) otherwise. Then V_1^c is given by

$$V_1^c = \sum_{i\in\mathcal{W}} r_\tau \lambda_i^\tau + \sum \inf_{c\in\mathcal{C}} \sum_{\tau=1}^{N_\tau} \hat{\lambda}_i^\tau d[(x_i^\tau, y_i^\tau), (x_1^{c^*}, y_1^{c^*})] \tag{5}$$

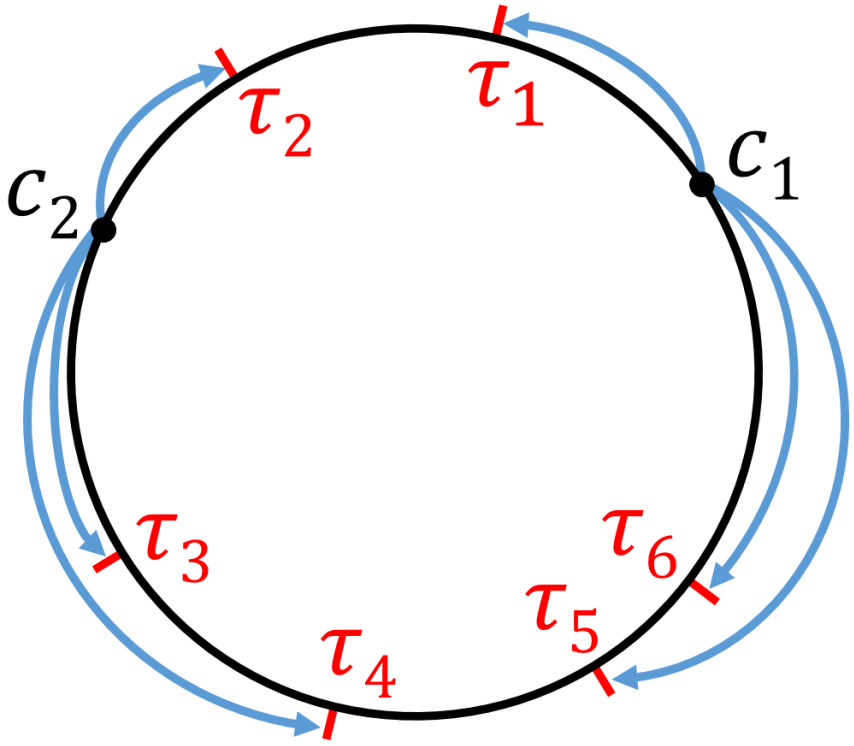
For a system with N_c standing committees, committees are placed at $(x_1^{c^*}, y_1^{c^*})$, $(x_2^{c^*}, y_2^{c^*})$, and so on, where these satisfy

$$\inf L(N_\tau, N_c) = \inf_{j\in\mathcal{C}} \sum_{\tau=1}^{N_\tau} \hat{\lambda}_i^\tau d[(x_i^\tau, y_i^\tau), (x_j^c, y_j^c)] = \inf_{j\in\mathcal{C}} \sum_{\tau=1}^{N_\tau} \hat{\lambda}_i^\tau \alpha(\tau_i, c_j) \tag{6}$$

Put differently, the Floor does not so much assign individual petitions to committees as much as it assigns entire topics to committees, according to (6). Hence the Floor seeks to minimize the losses in V_N^c, which satisfies

$$V_N^c = \sum_{i \in \mathcal{W}} r\lambda_i^\tau + \sum_{i \in \mathcal{C}} \hat{\lambda}_i^\tau \times d[(x_i^\tau, y_i^\tau), (x_j^{c^*}, y_j^{c^*})] + N_c k_c(\cdot) = \sum_{i \in \mathcal{W}} r\lambda_i^\tau + \sum_{i \in \mathcal{C}} \hat{\lambda}_i^\tau \alpha(\tau_i, c^*{}_j) + N_c k_c(\cdot) \quad (7)$$

Figure 2 – Topic Circle with Hypothetical Committee Placements



3.4.1 Existence of Placement Solutions and Decreasing Marginal Returns to Committees

The following Lemmas are necessary for finding the optimal allocation of committee locations.

Lemma 1: *The quantities V_j^c are well defined by a unique solution to equation* (6).

Proof: See Appendix. For the full topic circle, the uniform distribution on the circle guarantees that no two topics are ever exactly equidistant.

Lemma 2: *The differenced quantities $L_{N_c+1}^c - L_{N_c}^c$ converge to zero.*

The value of the first committee relative to disposition by the floor (V_1^c) is a function of what is gained by committee creation – namely the informational losses by Floor disposition alone, namely $\sum_{\tau=1}^{N_\tau} r\lambda^\tau$, minus k_c and the sum of informational losses by committee.

3.4.2 Optimal Policy

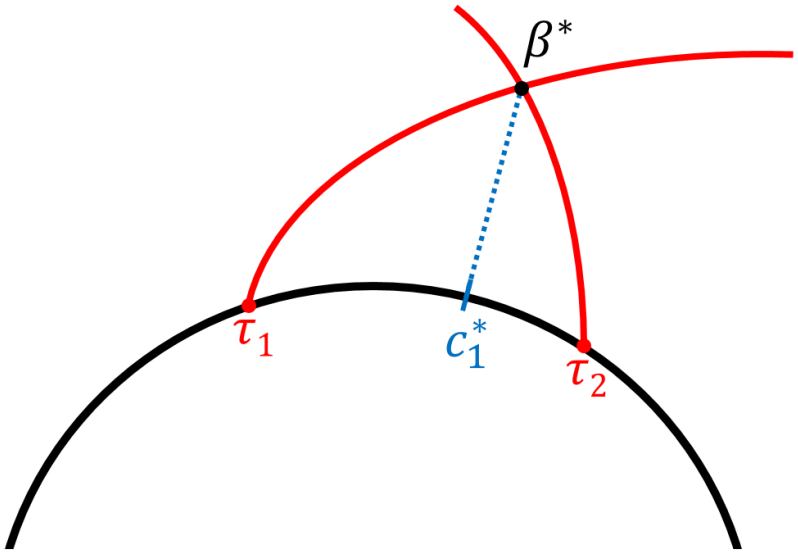
Knowing the series $\{V_j^c\}$ for any distribution of τ_i, λ_i^τ, the Floor creates committees until the number of committees N_c has values satisfying

$$V_{N_c+1}^c - V_{N_c}^c < k_c(\cdot) \tag{8}$$

Put simply, the Floor creates new committees until the marginal informational benefit of the next committee would be outweighed by the marginal cost of its creation.

We can think of the cost of committee creation as the cost of members' time plus agency losses. Under a constant committee cost assumption, each committee imposes the same burden on the floor. But it is equally possible that with a fixed number of members, each new committee adds burdens that fall ever more heavily upon legislators, in at least two ways. First, there are only so many members to go around, and with constrained time, each new committee means an increased likelihood of yet another committee assignment. Second, agency losses are not modeled directly in this framework, but one can imagine that the Floor has greater and greater difficulty monitoring committees as their number gets larger.

Figure 3 – Optimal Committee Placement with Angular (Inverted "Tent") Loss Functions



3.5 An Asymmetrically Informed Floor

If $\phi = (0, 0)$ then the model embeds the assumption that the floor is symmetrically (un)informed about all topics. There are several ways of relaxing this assumption, the simplest of which is to permit the floor's information point to depart from the center of the circle.[10]

3.6 Select Committees and the Member Assignment Strategy.

Now tweak the model a bit, and suppose that for each topic generator, the Poisson process is itself a sum of district-specific Poisson processes. For some topics, the floor thus has the opportunity to delegate its petitions to members themselves or some subset (of number q relatively small)[11] of those members that do not compose a standing committee in the sense of a topically focused group, but rather a geographically or constituency-based task group. Where $q = 1$, the select committee becomes an *omsbudsman assignment strategy.*

Imagine that, corresponding to each point on the circle, there is a line segment that is divisible into a set of bins, where each bin corresponds to a district. The point process is then the sum of all point processes of the constituent districts on that topic. For the Poisson point process, we can use the result that the sum of Poisson processes is itself a Poisson process.

Now suppose that all of the petitions on topic τ are coming from district 1. It is probably then the case that the member from that district knows more about this topic than any other member. It would then make sense for the floor to delegate the issue to this member alone. We might make this one of the choices in our model, namely leave the petitions issue to members. The cost of member assignment arises when petitions on the same issue come from other districts as well. To simplify, assume that the cost of one member dealing with petitions from another district is the same for all members.

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[10] Alternatively, one could imagine that the topics are separated from the floor by a general model of an ellipsoidal topic function. The analytic computation of expertise and asset specificity through arc lengths then becomes much more complex.

[11] To be clear, such select committees in the Virginia House of Delegates and the early U.S. House had three to five members, whereas standing committees of the period had considerably more members (15 or more in the House of Delegates and the U.S. House).

A world where the member assignment strategy performs the worst is a world in which the petitions on topic X are equally assigned across districts, i.e., where entropy is highest. In this respect, the model points to more general dynamics. Why are committee systems in legislatures organized by topic (or policy domain) and not geography? Our model may have an answer to this. Committees treat topics that are not reducible to districts.

4 Hypotheses

Before listing hypotheses generated by the model, we note first what our model does *not* predict. The simple presence of more petitions on the topic circle does not imply a greater incentive for the Floor to create more committees. Put differently, *the model does not predict that a legislature that receives more petitions in general at one time will create more committees.* The reason is that the Floor has ways of dealing with petitions that do not involve standing committees. If complexity is low enough (low r_τ, which implies higher general knowledge of the Floor, the Floor (acting as Committee of the Whole) will deal with the petitions itself, without a need to refer them to standing committees. (As we discuss below, early American legislatures often did just this when dealing with a petition that was easily adjudicated.) Moreover, if petitions are highly concentrated in a small set of constituencies, the Floor may decide to allow individual members to deal with them in an ombudsman strategy. Put differently, our model predicts that increasing petition rates generate new committees only conditional on topics and the petitions produced on those topics, in particular the combination of specific knowledge and entropy (dispersion of petitions across districts or constituencies).

- The probability of topic assignment to committee and the number of committees are both increasing in r_τ, or the complexity of the topic space
- The probability of a committee being created near topic τ_i is a strictly increasing function of the petition rate $\hat{\lambda}(\tau_i)$
- The probability of a committee being created near topic τ_i is a strictly increasing function of the entropy of the petitions' distribution across districts.

Full proofs are given in the appendix.

5 Petitions and Committee Formation in Revolutionary Virginia

In the wake of the American Revolution, the writing of state constitutions – constitutions that gave to legislatures the pre-eminent role in revolutionary state governments – marked the first concrete steps toward new republics (Wood 1970). Two of the most influential state legislatures were established in Virginia and Maryland (Squire 2012). Virginia was the largest of the early American states, and along with Massachusetts and Pennsylvania, its politicians played a leading role in the Revolution. As Virginia established its House of Delegates in 1776, it drew upon precedents from the colonial House of Burgesses. The House of Delegates spent considerable time, sometimes entire days, wrestling with new petitions. And these petitions appear to have given rise to new committees in the House's very first session (1776).[12]

On the first day of its very first session (October 7, 1776), the Virginia House of Delegates began electing a Speaker and discussing plans for resolving matters by reconstitution of the Committee of the Whole. On the second day (October 8), before any standing committees were created, the legislature read three petitions on the floor, tabling two and assigning one to a select committee. The House then "revived" three committees from its colonial predecessor – the Committee on Propositions and Grievances, the Committee on Publick Claims, and the Committee on Elections and Privileges (*Journal of the House of Delegates of Virginia, Anno Domini 1776* (Alexandria: Alexander Purdie, 1777), October 8, 1776, pp. 4-5; hereafter "JHDV"). Essentially two of these committees were for the purpose of adjudicating petitions – those launching complaints against the government and/or introducing bills (Propositions and Grievances), and those making claims upon the public treasury (Publick Claims).

Petitions and the Committee of Religion. On Friday, October 11, 1776, the House of Delegates created its first committee not revived from the colonial House of Burgesses, the Committee of Religion. It immediately read to the floor a petition from dissenters from the Anglican church in Prince Edward County and referred this petition to the Committee (*JHDV*, October 11, 1776, p. 9). The juxtaposition of these events and their import could not be clearer. The Anglican dissenters from Prince Edward County sent in the first in a long list of dissenters' petitions to the

[12]Our treatment here focuses upon some basic issues involving committee creation in the first session of the Virginia house of Delegates; a more historically nuanced study awaits another paper.

House of Delegates, asking for liberty of religious expression and association, requesting the end of all religious establishments (these would have been connected with the Church of England) and asking freedom from religious taxes that supported the establishments of the Church of England, and more generally "to make Virginia an asylum for free inquiry, knowledge and the virtuous of every denomination." The petition was obviously drawn up before October 11th, and it was obviously known to the legislature before the Committee of Religion was created.

The colonial predecessor of the House of Delegations – the Virginia colony's House of Burgesses – also had a committee devoted to religious affairs, but it had a subtly but critically different title, not the "Committee *of* Religion" but the "Committee *for* Religion." Unlike the Revolutionary Committee of Religion, which was established mid-session in 1776, the Burgesses' Committee for Religion had been ritually constituted and appointed at the beginning of each session, on the same day as the creation and appointment of the Committee of Propositions and Grievances, the Committee of Privileges and Elections, and the Committee on Publick Claims (see, e.g., John P. Kennedy, *Journal of the House of Burgesses of Virginia, 1770-1772* (Richmond, Virginia: Virginia State Library, 1906), February 11, 1772, p. 157). While Thomas Jefferson served as a member of the Burgesses in the early 1770s, he was not a member of the Committee for Religion. The colonial Committee for Religion was customarily occupied in the regulation of parishes and vestries, and in the 1770 session, it rejected the only petition it received from religious dissenters, that from Baptists asking to be excepted from the requirement to bear arms and receive muster roll training (Kennedy, *Journal of the House of Burgesses*, May 26th, 1770, p. 20; June 1, 1770, p. 40).

Being established in response to petitions and not "revived" at the beginning of the House of Delegates' first session, the new Committee *of* Religion in 1776 was quite different. It had some of the leading lights of the new state on its roster, including Richard Lee, James Taylor and Thomas Jefferson.[13] A slew of additional dissenters' petitions would come into the House of Delegates in the following weeks and months, from a range of different counties and constituencies, and Anglican ministers would themselves launch a counter-petitioning campaign late in the session (*JHDV* 1776, Friday, November 8, 1776, p. 62). Operating from the Committee for Religion, Jefferson joined with James Madison to create an important new statute that accorded to the dissenters their basic

[13]James Madison was added October 14th; *JHDV* 1776, October 14, 1776, p. 16

wish to be free from religious tax impositions: "An act for exempting the different societies of Dissenters from contributing to the support and maintenance of the church as by law established, and its ministers, and for other purposes therein mentioned."[14] To early Virginia state politicians, the reasons for paying particular attention to these propositions and grievances were manifold. Dissenters were crucial to the military alliance against England during the War for Independence, and opposition to established English institutions was critical to maintain for the cohesion of the revolutionary effort. Beyond this, many Delegates, following Jefferson, believed sincerely in the dis-establishment of religion in the new United States of America.[15][16]

One might wonder, indeed, if the petitions had been solicited by Delegates eager to gain the trust of dissenters in the early years of the Revolutionary war effort. This possibility is real but it does not interfere with our inference that the petitions and not politicians' original plans induced the House of Delegates to create the Committee of Religion and the 1776 tax exemption statute. Put differently, if the dissenters' constituencies were so well known to Virginia Delegates before their petitions arrived, and if currying their favor was so critical to the Revolutionary effort, why had not the Virginia House of Delegates created its Committee on Religion on the first day, along with all of the others? And why had it not passed its exemption statute earlier as well? The fact that the exemption statute was drawn up in a committee that received more petitions than any other during the House of Delegates' 1776 session, and the fact that the statute's language borrowed so heavily

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[14]William Waller Hening, ed., *The Statutes at Large; Being a Collection of All the Laws of Virginia from the First Session of the Legislature, in the Year 1619* (Richmond: J. & G. Cochran, 1821): 9:164-166. Reprinted at Encyclopedia Virginia, http://www.encyclopediavirginia.org

[15] Charles F. James, *Documentary History of the Struggle for Religious Liberty in Virginia* (Lynchburg, VA: J. P. Bell, 1900; reprint, New York: Da Capo Press, 1971); John K. Nelson, *A Blessed Company: Parishes, Parsons, and Parishioners in Anglican Virginia,1690-1776*, Chapel Hill: University of North Carolina Press, 2002.

[16]The diplomatic and military importance of the dissenters reinforces the fact that for early American legislatures, failure to consider petitions posed not only electoral losses but also other jeopardies which in the calculus and estimation of the legislature were arguably as or more important than electoral considerations.

from that of the petitions, shows that the House of Delegates, including Jefferson himself, relied heavily upon the petitions to organize the dis-establishment effort and create legislative institutions to govern religious policy in the new Commonwealth.

The subsequent history of the Virginia Committee of Religion is somewhat better known.[17] The Committee continued its work under Jefferson and Madison, and when Jefferson became governor in 1779 he handed off much of his work to John Harvie. Within a few years' time, the Committee of Religion was introducing "An Act for Establishing Religious Freedom," and the Act became law in 1786. It is regarded as the most advanced religious freedom ordinance of its time and clearly a precedent for the religious non-establishment clause of the First Amendment to the U.S. Constitution.

Empirical Analysis of Petitions and Committee Creation in Virginia, 1776. The case study of the Virginia Committee of Religion points to a more general dynamic. For those topics and policy domains where the Virginia house of Delegates received more petitions, it created more committees. We illustrate this in a small sample exercise for the first session. The Virginia Library and Archives has helpfully catalogued all of the legislative petitions received, and we have made use of these here and elsewhere (Carpenter 2017). Helpfully, the Virginia Library and Archives has already categorized the petitions into separate topics. For the 1776 session, no topic as coded by the Virginia Library and Archives was the subject of more petitioning than "Religion and Churches." The Virginia archivists have created 38 topic areas to which committees can be assigned. We discard two of these – "Railroads" and "Miscellaneous" – as being impertinent to our categorization.

We tabulate both the presence of committees for a given topic at the end of the legislative session for 1776 and the change in the presence of a topic from beginning to end for the 1776 session (essentially a differenced measure) and conduct regressions of these variables upon two independent variables: (1) the number of petitions received for that topic (or its natural logarithm), and (2) the entropy of petitions across constituencies from which petitions were sent, as well as the natural logarithm of this variable.[18] Results from these small-sample regressions appear in Table 4.

[17] Again, we reserve further examination of religious petition and this committee to another paper.

[18] Results are qualitatively similar when we use the Herfindahl or its log.

Table 4 – Regressions of Committee Formation upon Petitions and Entropy of Petitions, Virginia Legislature 1776

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Committees	Committees Added	Committees	Committees Added	Committees	Committees	Committees Added
$Petitions_{t=1776}$	0.09***	0.06***					
	(0.02)	(0.01)					
$\ln(Petitions_{t=1776})$			0.29***	0.15**		-0.04	-0.09
			(0.07)	(0.06)		(0.14)	(0.12)
$Entropy_{t=1776}$					0.10***		
					(0.03)		
$\ln(Entropy_{t=1776})$						0.48**	0.34**
						(0.18)	(0.15)
Constant	0.03	-0.01	-0.01	-0.01	0.14	0.05	0.03
	(0.06)	(0.04)	(0.07)	(0.06)	(0.11)	(0.06)	(0.06)
Observations	36	36	36	36	17	36	36
R-squared	0.42	0.37	0.35	0.17	0.37	0.47	0.28

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The small-sample regressions make it clear that petitions are a strong predictor of topic-based committee formation in the first session of the newly established Virginia House of Delegates. To get some sense of the predictive strength of the simple OLS model, petitions alone predict two of the three committees added by the legislature mid-stream during its 1776 session (Religion and Courts & Justice).

The entropy measure is highly correlated with the petitions measure. Put simply, those topics that saw more petitions were more likely to have petitions more widely spread among constituencies. Yet when the Shannon entropy measure is logged, it is the single most powerful predictor of committee formation in the 1776 session. In this light it is notable that the petitions on religion had by far the highest dispersion across constituencies, coming in from Albemarle County, Amherst County, Culpepper, the presbytery of Hanover, the parish of Botetourt, Loudoun County and others. Indeed, because several of the petitions did not identify a specific county, parish or township of origin, our measure probably understates the entropy of religious petitions.

Both the narrative and small-sample quantitative evidence, then, suggest that when the newly established legislature of America's largest free state assembled in 1776, it created its committees to respond to petitions, and that the irreducibility of petitions to legislative districts was a powerful force impelling the House of Delegates toward standing committees to deal with petitions. The fact that these committees later authored some of the most important legislation in American history – the exemption act of 1776 and the Virginia Statute on Religion Freedom of 1786 – points to the force of the deep linkage between petitioning, committee formation and policy development.

6 Petitioning and Petition Disposition in the Early House

As were other early American legislatures (Squire 2012), the early U.S. House found itself flooded with petitions. The early congresses wrestled with how to manage them, deliberate upon them, and dispose of them: "By the middle of Congress's second session, the process of petitioning began to be stifled by its own success. The flow of petitions – mostly Revolutionary War Claims – was at full flood" (Bowling, DiGiacomantonio, and Bickford 1998, p. xi). So consumed by the discussion of petitions was the early Congress that one editorial writer ("Candidus") wrote in 1790 in the *Gazette of the United States* and wondered aloud "Why is so much attention paid to trifling memorials?

... And why should we support men at Congress to trifle away their time upon them?" (Bowling, DiGiacomantonio, and Bickford 1998, p. xi).

> The answer to questions of this kind if obvious. Justice is uniform. It is the same when administered to an individual, a state or a nation... There is a mutual dependence between the supreme power and the people. And since the whole government is composed of individuals, does it appear inconsistent that individuals should be heard in the public councils? Much depends on public opinion in matters relating to government. Some deference therefore should be paid to it. *In order to gain the confidence of the people they must be fully convinced that their memorials and petitions will be duly attended to when they are not directly repugnant to the interest and welfare of the community.* [Emphasis added.]

Candidus' words reminded his fellow readers, and remind us now, that petitioning was sacrosanct in early America. Petitioning was protected along with the rights of speech, press and peaceful assembly in the First Amendment. No such protection was accorded to voting at the time. The idea that each and every individual citizen had a privilege of hearing before the American government – according to a principle of justice – became a form of equal standing before the legislature, one that echoes equality of standing in American courts (McKinley 2016). And while congressional petitioning patterns owed much to British precedent, the protections for petitioning in the American constitution were stronger than those in Britain. Britain, after all, continued to be governed (albeit as much in the breach as in the fidelity) by the Act Against Tumultuous Petitioning of 1662 (Knights 1993; Innes and Philp 2013; Carpenter 2016).[19] And when British mass petitioning exploded in the Chartist movement of the late 1830s and early 1840s, it was met with suppression of the sort that would never have been counseled in the United States.

[19] "In its handling of petitions, as with all procedural matters, the First Congress faced a lack of precedents that could be both frustrating and liberating. If they looked to their former mother country for models to imitate, American legislators would have found greater differences than similarities" (Bowling, DiGiacomantonio, and Bickford 1998, p. xiv).

As Figures 4 and 5 show, the early House received many petitions, and the numbers began to fall off slightly before the War of 1812. Yet the antebellum House would, starting in the 1820s, receive more petitions on a per-capita basis than it had in the Early Republic.

Figure 4 – Petitions Received by House Over Time

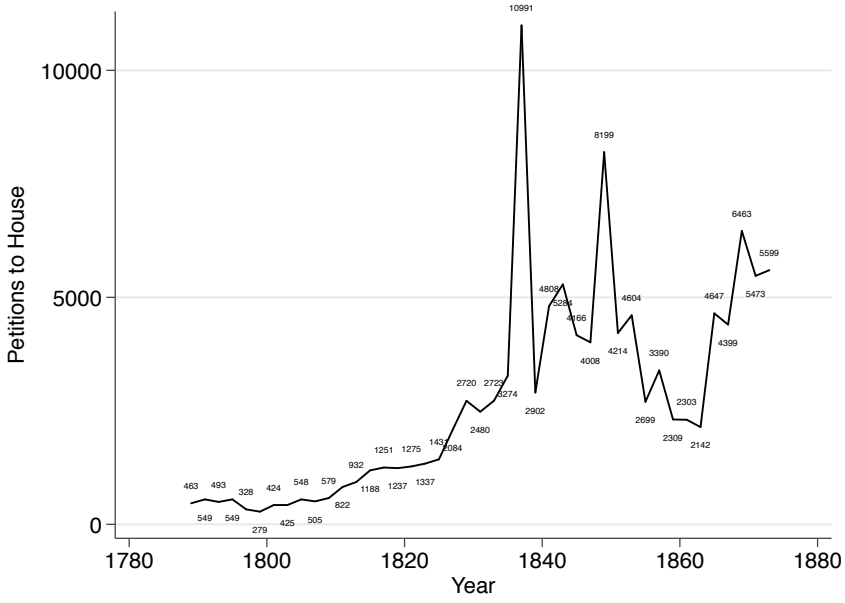
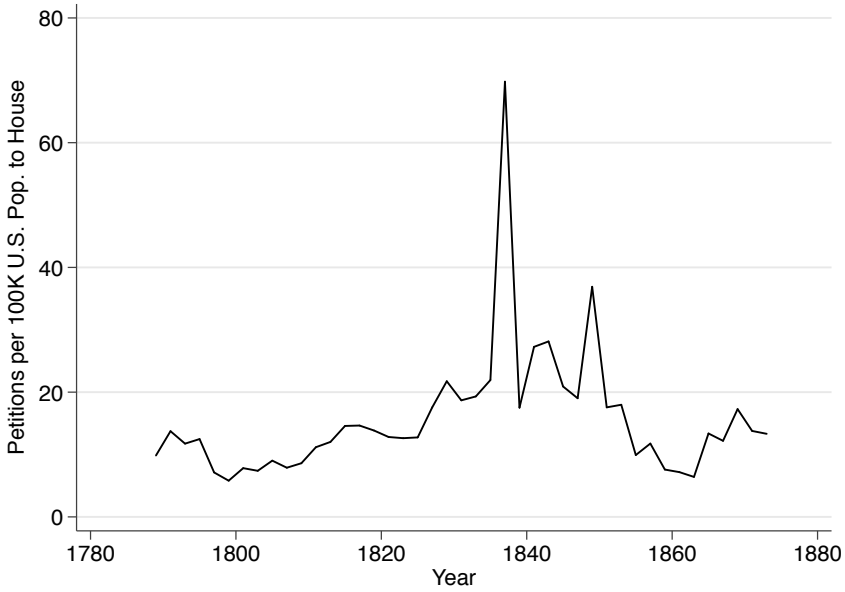


Figure 5 – Petitions per 100K U.S. population Received by House Over Time



7 Petition Tracing through The *House Journal* – A New Dataset

Because petitions are difficult to trace, scholars and students of U.S. history and the U.S. Congress have lacked access to data like that depicted in Figures 4 and 5. Assuming the fidelity of archival collections, systematic research in archives can offer data for aggregation of petitions over time and across geographical constituencies (Carpenter and Moore 2014). Yet the reliability of these archives varies heavily – many antislavery petitions after the 28th Congress, for instance, have been lost to deterioration or fire – and the collection of systematic data remains highly costly.

While archival validation of petitions is important and we have pursued it elsewhere, we adopt an alternative strategy, exploiting the fact that, in theory at least, each petition sent to Congress would be read on the floor of the appropriate chamber. Using the availability of legislative records that trace legislative action per session on a daily basis permits researchers to capture the daily introduction and initial disposition of petitions. Other scholars have followed this lead, though usually only for specific issues or bills. Theriault (2003) draws upon the *Congressional Record* to construct a measure of petitions received per member in the debate over the Pendleton Act of 1883. Carpenter and Schneer (2015) draw upon the *Globe* and the *Register of Debates* to track petitions sent to Congress on the issue of reauthorization of the Second Bank of the United States. Schneer (2016) draws upon the *Congressional Record* to construct a measure of petitioning activity before and after the 17th Amendment.

The reliability of debates and deliberative registers for the early congresses is, however, questionable. For one, as with any *Register of Debates* and any journal, these sources are dependent upon the diligence and completeness of the legislative recording system in place. For another, the early Congress did not have a systematic record-keeping process for petitions of the sort that can be exploited for the late nineteenth and early twentieth centuries, when incoming petitions were assigned tracking numbers. Theriault's and Schneer's studies seem on safer ground on this score, exploiting petitions after 1880, while Carpenter and Schneer (2015) benefit from the fact that, during the Bank War, Henry Clay instructed the Senate clerk to systematically track petitions arriving in both chambers on the Bank issue, resulting in a higher degree of accuracy than for other issues of the time. Yet for tracing petitions in the early and critical formative period of the antebellum U.S. Congress, none of these strategies is available.

We began with the *Annals of Congress* and the *Register of Debates*, tracing petitions and their disposition. When we turned to the *House Journals*, we found that our quantitative strategies relying upon the *Annals* and *Register* systematically undercounted petitions, with *Journal* aggregates two or three times as high per congress and often more so. We then focused exclusively upon the *House Journal*. As early as ten days after the House first achieved a quorum, petitions were presented to the House and recorded in its *Journal*. The corresponding entries in the *House Journal* (as well as those in the *Senate Journal*) are the primary source of our data set. Although there exists some variation to the extent of information included with each petition presentation, the journals usually record the member of Congress presenting the petition, descriptions and/or names of the petitioners, the geographic location of the petitioners, the prayer or request contained in the petition, whether the petition was initially tabled or referred, and – in case of a referral – the destination of said referral. Petitions were frequently referred to committees, but also to members of the executive branch such as the Secretary of State or the Postmaster General.

Since our primary source material consists of records and minutiae of thousands of days of Congressional meetings, gathering this data by hand was not feasible; instead we built and implemented an algorithm that identifies and extracts the associated information for petitions read and presented to Congress. We used an aggregation strategy that depends upon supervised learning. Over a two-year period, human readers (undergraduate students, law students and Ph.D. students) coded over two hundred randomly selected legislative days, noting each petition and, for each petition, a battery of numerical, categorical and text fields. A large number of these legislative calendar days were coded by two or three coders so that reliability statistics could be established. From these human codes, we composed a training dataset that instructed an algorithm for identifying petitions and coding their various properties. We describe features of this algorithm below.

In summary, for this paper, we created an original data set consisting of all petitions presented to Congress between 1789 (1st Congress) and 1875 (43rd Congress) and recorded in the *House Journal*. Although we restrict our analysis to petitions presented to the House in this paper, we have also gathered data on more than 50,000 petitions presented to the Senate during the same time period. These data are far from perfect – any petition missed (or elided with others as "sundry")

by the chamber clerks is missing from our data – yet permit historical comparison on a more systematic scale than any previous database.[20]

The potential uses of these data are vast and we can but touch barely upon them here. As Figures 4 and 5 suggest, they permit a general accounting of petitioning activity for the U.S. House over time. Yet with further refinement of the data, they also permit more searching analyses of petitioning by constituency (district, state and county or township), as has been conducted for Theriault (2003), Carpenter and Moore (2014), and Carpenter and Schneer (2015).

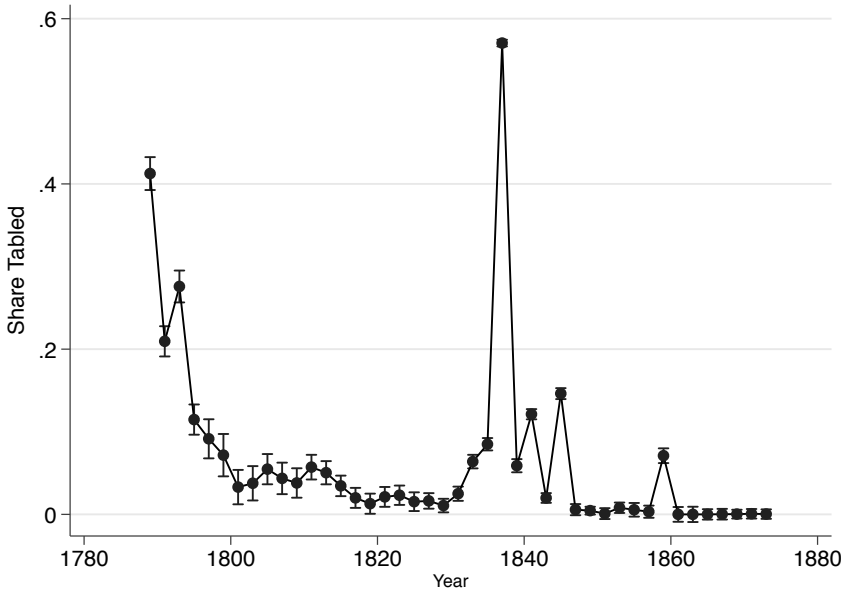
Analysis of committee formation and petitioning requires some account of how the petitions were introduced and disposed of after having been read upon the House floor. We begin with two descriptive sketches that together suggest the difficulties faced by the early House in managing an immense flow of petitions. The House and Senate often tabled petitions in their early years, not as a form of rejection but often enough as a result of not having clear procedures or ideas for how to deal with the request or grievance raised in the petition.[21] The *House Journal* permits a clear measurement of tabling as the first disposition of the petition on the floor. Petitions could be tabled at first only to be taken up later and assigned to a select or standing committee. The algorithm at present identifies only the initial tabling of petitions upon their introduction to the floor. Figure 6 displays the initial tabling probability by congress, based on a linear probability model (omitting the constant term), with 95 percent confidence intervals attached to each probability estimate.

The evolution of petition tabling upon introduction is characterized by a general decline from the first through seventh congresses, with a precipitous decline after the third. Tabling probabilities

[20] Also, with the algorithm having been constructed and the human codes archived, the *construction* of the data is replicable – unlike trips to the archive in search of petitions.

[21] Note the critical difference between these acts of tabling and the kind of tabling that occurred under the gag rule (Miller 1998). Under the Pinckney gag rule, the House declared that all petitions that would henceforth be sent on themes of slavery would be tabled and, furthermore, would not be read upon the House floor. The conduct of the House under the Pinckney gag, as well as John Quincy Adams' famous attempts to evade its restrictions, demonstrate as much about pre-existing equilibrium institutions for petition receipt, deliberation and disposition as they do about the gag rule controversy itself.

Figure 6 – Share of Petitions Tabled by House Over Time



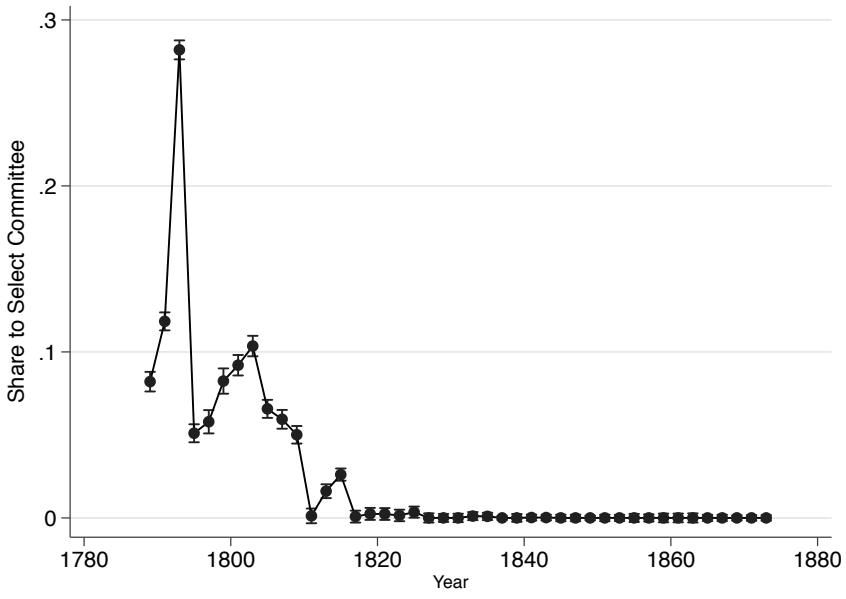
for a petition introduced on the floor hovered around 5 percent through the 13th Congress only to dip even lower. The first three congresses engaged in a high rate of tabling of their petitions, consistent with Cooper's (1961, p. 43) remark that by the fourth congress committees could report judgment ("opinion") as well as facts upon a bill or a petition. Yet with the rise of intersectional and ideological conflict over slavery in the 1830s, the House begins to table an increasing percentage of petitions upon introduction, rising from the 22nd Congress (1831-1833) to an all-time peak in the 25th (1837-1839) with the Pinckney gag.

This tabling activity is roughly consistent with a portrait of the House "puzzling through" its representative business in the early years (Gamm and Shepsle 1989, p. 43-46) and learning jurisdictions and assignment of memes to those jurisdictions. As the standing committee system of the early House was sparse, the House relied heavily upon select committees (often called "ad hoc" committees in the literature) for its work (Jenkins and Stewart 2012, p. 31).

Standing committees were formed for many reasons, such as dealing with business raised by the President or one of the executive departments, consideration of bills, and not least, petitions. The *House Journal* again permits a systematic examination of the referral of petitions first introduced

to a select committee, and Figure 7 displays the probability of any single petition being disposed by referral to a petition-induced select committee, by Congress.[22]

Figure 7 – Share of Petitions Referred to Select Committee in House Over Time



As Figure 7 suggests, petition disposition by initial referral to a select committee gradually decreased in the antebellum U.S. House, to the point where the practice virtually disappeared with the 29th Congress (1845-1847). Yet the decline is neither uniform nor monotonic, with a significant spike in select committee referrals in the Third Congress and again in the Eighth Congress. Given that over 1,000 petitions each congress were being sent to the House from the 14th Congress onward, even a disposal rate of two percent by select committee meant that 20 or more petitions per congress often received their own committee. The reason for the decline in select committee referrals, of course, is that the standing committee system had formed and property rights over jurisdictions had solidified in the period from 1810 to 1825 (Gamm and Shepsle 1989; Jenkins 1998).

[22] As with Figure 6, the estimates in Figure 7 are produced from a simple descriptive linear probability model, where the indicator variable is regressed upon a battery of congress-specific dummies only, without a constant term. The vertical lines represent the upper and lower 95-percent confidence intervals that subtend the estimate for each congress. These probabilities are thus jointly estimated and statistically comparable using tests of linear restrictions (e.g., Wald).

7.1 Classification of Petitions

In order to properly examine the formation of select and standing committees from petitions, topical classifications are required that place each petition into a plausible category that could serve to link the subject of the petition with the subject of the committee. The difficulty of performing this classification points to the inherent complexity of jurisdictions (King 1997). Jurisdictions were all the more complicated in a new legislature whose categories were being defined by a new nation facing new problems. In a way, we think, the early House and Senate were faced with the problem not entirely unlike that of the strategic but informationally and behaviorally constrained statistical classifier attempting to produce a "statistical topic model" for a set of symbolic expressions. The desiderata of these early Congresses were of course quite different — electoral incentives, the ever-looming threat of armed insurrection by disgruntled petitioners (especially military veterans), individual turf incentives for issues they or their constituents cared about.

A crucial step in tracing the inflow of petitions to ad hoc committees and to standing committees is to reliably identify the subject of the petition without using information on committee referrals. To do this, we have adopted a supervised learning approach in which we have had human coders classify petitions into a set of mutually exclusive categories based upon the codings used in the policy agendas project.[23] The coders have classified 4,050 House petitions in total. After training an ensemble classifier on this set of 4,050 petitions, we then use the resulting model to predict the category of the remaining (more than 100 thousand) petitions in the sample. To implement this approach, we use the text of the description of the petition in the *House Journal* as the

[23]The categories are: "DOMESTIC COMMERCE", "LAW/CRIME", "DEFENSE", "FOREIGN TRADE", "MACROECONOMICS", "GOVERNMENT OPERATIONS", "CULTURE", "AGRICULTURE", "INTERNATIONAL AFFAIRS", "PUBLIC LANDS", "TRANSPORTATION", "CIVIL RIGHTS", "IMMIGRATION", "EDUCATION", "TECHNOLOGY", "HEALTH", "LABOR". The codings used here were originally devised by Frank R. Baumgartner and Bryan D. Jones, with the support of National Science Foundation grant numbers SBR 9320922 and 0111611, and are distributed through the Department of Government at the University of Texas at Austin. Neither NSF nor the original collectors of the data bear any responsibility for the analysis reported here.

primary input. For instance, a petition from March 1, 1836 (24th Congress) was recorded in the *House Journal* as follows: "Mr Ashley presented a memorial of citizens of St Louis, in the State of Missouri, praying that the Cumberland road may be so located as to pass through the city of St Louis." For the text of each petition, we removed the numbers and punctuation, put all characters in lower case, removed stopwords, stemmed the document, and stripped any remaining whitespace. With what remained, we created a document term matrix indicating the word frequencies for each petition. We removed sparse words (i.e., those that appear very rarely in any documents) and then normalized the word frequencies. With the document term matrix in hand, we trained the classifier on the already-classified petitions and used the results to predict the category for unclassified petitions. The ensemble approach that we implemented consists of two different classifiers: a random forest model and a support vector machine model.[24] To make a classification, each classifier yields a predicted probability for a given category. We averaged across the predicted probabilities to combine the results from both classifiers. This yielded a single predicted probability for each petition denoting the probability of being in a given class.

One point of complication is that any single petition can only be categorized into one of seventeen possible categories. Rather than model all seventeen categories simultaneously, we instead simplified the problem by performing seventeen separate binary classifications. For example, for the category "GOVERNMENT OPERATIONS," we placed all coded petitions that fell in this category into the "on-topic" category and all other petitions into the "off-topic" category. We then ran the classifiers on the training set of petitions and recovered predicted probabilities for the full set of petitions in the sample. We repeated this process for each of the seventeen categories. As a result, for each petition we actually estimated the predicted probability that it was on the topic of each of the seventeen categories. To make our prediction, we placed the petition into the category with the highest predicted probability. The classification procedure performed well. To test the accuracy of classification using this method, we initially trained the model on ninety percent of the total petitions, and then we made predictions on the remaining ten percent of petitions. By comparing our prediction to the actual hand codings, we can assess the performance of the classification procedure implemented.

[24]For details on the models, see Friedman, Hastie, and Tibshirani (2001).

Across all categories, the classifier placed the petition in the correct category 71% of the time. Table A.2 in the Appendix displays the confusion matrix, i.e., a comparison of actual vs. predicted categories. To assess its performance further, we compute precision and recall statistics for each topic, and calculate a weighted average across topics to get an overall measure of classifier performance.

Precision refers to the percentage of true positives divided by the number of true positives and false positives. That is, precision captures the share of positive classifications that were made correctly. Recall refers to the percentage of true positives divided by the number of true positives and false negatives. That is, recall refers to the share of correct classifications made conditional on the petition actually being on-topic. On average, our classification led to a precision value of **0.709** and a recall value of **0.708**. While there is room for improvement, these statistics suggest that the bulk of the time classifications are being made correctly both in terms of petitions we coded as on-topic actually being on topic (precision) as well as actual on-topic petitions being coded as such (accuracy).

With these classifications in hand, the historical patterns in Figures 1 and 2 can now be "disaggregated" by examining the over-time variation of petitions by theme. We present these data in Figures A.1 and A.2 (in the Appendix), which together demonstrate the heterogeneity of petition development across issue areas.

The historical patterns in Figures A.1 and A.2 demonstrate that the large-scale evolution of petitioning to the U.S. House depicted in Figures 4 and 5 remains but a composite of heterogeneously-themed petitions. As the graphs do not control for population, even a trembling of activity in the early congresses represents an appreciable "political workload" for the House. Some themes are well represented in the early congresses, particularly Public Lands, Defense, and Government Operations. Other themes such as Transportation and Foreign Trade must await the 1830s for consistent representation.

One final, fundamental concern about topic classification is whether the Policy Agendas categories apply well to legislative politics before the Civil War. While we believe the broad categories used in the Policy Agendas project are reasonable to use across time, we have also employed an

alternative set of categories tailored more explicitly to the early congresses. We replicate our core analyses using these alternative topic codings and make the results available in the Appendix.[25]

8 Petition Flow and Standing Committee Formation – Aggregate Relationships

Recent research has now clarified the development of standing committees in the House, extending from classic studies of McConachie (1898) and Cooper (1970). Political scientists have learned that critical developments in the standing committee system of the House occurred between 1810 and 1825, and that party and chamber leadership (especially of Henry Clay) was crucial to the development of these committees and to their assignments (Gamm and Shepsle 1989; Jenkins 1998; Jenkins and Stewart 2012).

The emergence of petitions and jurisdictions in the early U.S. Congress is itself difficult to study, given not least that petitions were often sent to particular committees (whose members and chairs may have invited them), and that House leaders likely created certain committees to deal with business that had been composed substantially by petitions in the first place. The question of whether *particular* thematic committees formed in this period, for some jurisdictions before others, has not attracted as much scholarly attention.

The analysis of standing committees over time is complicated by the fact that many standing committees were created only later in the antebellum period, with few standing committees created before 1800 (Gamm and Shepsle 1989). Students and scholars interested in detecting linkages will therefore note that only as select committees begin to fade away do a large number of standing committees being to emerge. These committees and their order of appearance appear in Table 5.

[25]These alternaive categories are: "INFRASTRUCTURE / TRANSPORTATION", "MILITARY / NAVY", "PENSIONS", "TARIFF / TAX", "PUBLIC LANDS / TERRITORIES", "CLAIMS", "EXPENDITURES", "FINANCE / BANKING / ECONOMY", "CIVIL RIGHTS / SLAVERY", "FOREIGN AFFAIRS", "JUDICIARY", "LABOR", "REGULATION". To preview, our results largely hold up under the alternative classification scheme.

Table 5 – Creation of Standing Committees by Congress

First Cong.	Last Cong.	Committee
1	53	Elections
3	79	Claims
4	15	Commerce and Manufactures
4	40	Revisal and Unfinished Business
4	79	Ways and Means
8	79	Accounts
9	79	Public Lands
10	79	District of Columbia
10	79	Post Offices and Post Roads
13	79	Judiciary
13	19	Pensions and Revolutionary Claims
13	47	Public Expenditures
14	69	Expend., Navy
14	69	Expend., P.O.
14	69	Expend., State
14	69	Expend., Treasury
14	69	Expend., War
14	69	Expend., Public Buildings
14	61	Private Land Claims
16	79	Agriculture
16	51	Commerce
16	61	Manufactures
17	79	Foreign Affairs
17	79	Indian Affairs
17	79	Military Affairs
17	79	Naval Affairs
19	21	Military Pensions
19	42	Revolutionary Claims
19	79	Territories
22	79	Invalid Pensions
22	46	Revolutionary Pensions
22	41	Roads and Canals
24	61	Militia
25	69	Mileage
25	79	Patents
25	79	Public Buildings and Grounds
28	36	Engraving
31	79	Rules
36	79	Enrolled Bills
36	79	Library
36	61	Pacific Railroad
36	79	Printing
37	69	Exp., Interior
38	79	Coinage, Weights, and Measures

Continued...

First Cong.	Last Cong.	Committee
39	79	Appropriations
39	79	Banking and Currency
39	79	Civil Service
39	79	Mines and Mining
40	47	Education and Labor
40	43	Freedman's Bureau
40	79	Revisal of the Laws
41	69	Railways and Canals
41	68	Reform in the Civil Service
42	45	Mississippi Levees (renamed # 132)
43	69	Expends., Justice
43	79	War Claims

8.1 Panel Estimation

As an analytic starting point, we draw upon the general thematic categories culled from petitions in our earlier analysis. We know that petitions arrived in these categories variably over time (see Figures A.1 and A.2). Given assignment of standing committees to these same categories, we can observe time-series cross-sectional variation in the emergence of standing committees based on the inflow of petitions of different topics. We then turn to examine *whether changes in petitioning by general topic were associated with changes in standing committee formation by topic*, which is one of the key hypotheses derived from our model.

To trace the creation of new standing committees as a function of the inflow of petitions, we have to identify which petitions are linked in terms of subject matter to which standing committees. We have done this manually. We assign at least one (and sometimes several committees) to topics. The idea is that petitions classified as on-topic would likely be referred to one of the linked committees if the committee existed at the point in time that Congress received the petition. We also include a mapping of topics to committees that imposes the restriction that each committee can deal with only one topic. For reference, we include a table matching standing committees to topics. Table A.3 in the Appendix denotes our mappings.

Turning to estimation, our dependent variable is, for each topic and each congress, the number of standing committees that exist at that time. Our principal independent variable is, for each topic and each congress, the number of petitions recorded in the *House Journal*. With 17 topic categories and 43 congresses, our data comprises a "long panel" (i.e., $t >> i$), and therefore the

model that best fits the data will likely be dynamic (Greene 2003, p. 410). The standard approach to fitting data in a long panel to an empirical model is to include a group fixed effect and a lagged dependent variable. However, given concerns about inconsistency and bias arising from including a lagged dependent variable, particularly in the presence of serially correlated errors, we elect to report results taking several different estimation approaches.

First, results from fixed-effects panel estimation appear in Table 6 and, in the Appendix, Table A.1. Table 6 allows committees to be matched to multiple topics. In Table A.1, we impose the restriction that a committee may only be linked to petitions of one topic (i.e., individual committees are matched with only topic area, though one topic area may cover multiple committees). The models control for time effects with a linear Congress time trend, and we do not include the lag of committees from the previous period. We eschew strong causal inference claims from these data because for one there may exist "pure" endogeneity whereby petitions arriving in a given congress are sent because there is a (new) committee to receive them or because constituents expect such a committee to be created in the future.

We first estimated the relationship linearly, with number of committees regressed upon number of petitions with different lag structures. This produces a positive and statistically significant estimate, but we immediately turned to the possibility of a log-log relationship, where there are diminishing returns both to high numbers of petitions and high numbers of committees.

We began by regressing standing committees on the inflow of petitions by topic while including a Congress time trend as a control. In this sparse model, we observe a positive relationship between the inflow of petitions and creation of standing committees in a given topic. Next, we estimate the relationship with five lags of the petition count variable and found that only several of the petition variables (the one-congress, two-congress and four-congress lags) yielded substantively or statistically significant coefficient estimates. The relationship between petitions from the previous Congress and committee formation was particularly strong, so we elected to include petitions and their lag in subsequent models.

Because the model regresses the logarithm of committees on logarithm of petitions, the estimates are amenable to interpretation as elasticities. Model 2 of Table 6 suggests, for instance, that a 100-percent increase on a general topic in petitions in a given congress and the congress before is associated with a seven percent increase in the number of standing committees devoted to that

Table 6 – Log-log regressions of standing committees upon petitions, by topic and congress, 1st through 43rd Congresses. Topics Paired With Multiple Committees

	All					1st-36th Congresses	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ln(*Petitions*)	0.072***	0.033*	0.047***	0.041**	0.034**	0.067***	0.058*
	(0.025)	(0.017)	(0.015)	(0.018)	(0.016)	(0.018)	(0.032)
ln($Petitions_{t-1}$)		0.034***	0.049***	0.040**	0.031*	0.057**	0.037
		(0.009)	(0.016)	(0.017)	(0.017)	(0.022)	(0.022)
ln($Petitions_{t-2}$)		0.016*					
		(0.009)					
ln($Petitions_{t-3}$)		0.012					
		(0.007)					
ln($Petitions_{t-4}$)		0.016*					
		(0.008)					
ln($Petitions_{t-5}$)		0.015					
		(0.017)					
ln(*PresMessage*)			-0.007	-0.004	-0.003		-0.008
			(0.009)	(0.009)	(0.010)		(0.009)
Entropy				-0.032	-0.012		-0.021
				(0.034)	(0.034)		(0.033)
Share Newspaper Articles On Topic					-11.258		
					(8.664)		
Constant	0.042	0.066	0.049	0.101	0.244	-0.053	-0.008
	(0.090)	(0.090)	(0.091)	(0.125)	(0.198)	(0.100)	(0.130)
Congress Time Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Topic FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	731	646	714	589	481	578	466

Standard errors in parentheses
Standard Errors clustered at topic level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

same topic in that congress (.033 + .034 = .067). These estimates persist when controlling for measures of what topics are on the national agenda. Specifically, we determined the word count apportioned to each topic over time in the President's Annual Messages to Congress, and we include this as a control variable in Models 3, 4, 5 and 7. Similarly, we included as a control a measure of contemporaneous newspaper coverage of the issues in each topic area.[26] In each case, our measures of the outside agenda do not strongly predict creation of committees covering a given topic (see Specification 5).

Some of the stronger results are obtained when restricting the sample to pre-Civil War congresses. For example, in Model 6 of Table 6 we estimate that a doubling of the number of petitions in a given congress and the congress before are associated with a 12.4 percent increase in the number of committees associated with that topic. The 95% confidence intervals on this estimate do not overlap with zero. Model 7, which includes controls, yields similar results though with a slightly diminished magnitude and slightly increased uncertainty around the estimate. While these elasticities may appear small, it is important to keep in mind that the congress-to-congress variation in petitions (especially by topic; see Figures A.1 and A.2) is much higher than the congress-to-congress variation in standing committees. Many-fold increases in petitions by topic across congresses occur quite commonly, in fact, not least for the earlier congresses of our period. Hence the results offer plausible explanatory power for the creation of a number of committees by topic in different general themes. Finally, when imposing the additional restriction of limiting each committee to just one topic area, the estimates are generally in the same direction though noisier. Table A.1 in the Appendix presents these estimates.

One concern with this regression framework is that the outcome variable is highly persistent, or "sticky", from Congress to Congress. Furthermore, because Congress has generally been more

[26] To do this, we scraped the text for over 300,000 digitized newspaper front pages available for our timeframe from the Library of Congress *Chronicling America: Historic American Newspapers* site and used the same pre-processing steps described earlier. See `http://chroniclingamerica.loc.gov`. We then searched this database for the top 20 keywords associated with each topic area and determined the share of articles in each Congress containing one or more of these keywords. The database was missing newspaper data from the 12th to 19th Congresses.

likely to create additional committees rather than eliminate them, the outcome variable does not ever revert to zero. In this sense, past values of committees clearly relate to future values. We therefore also estimate a set of models that include a lagged dependent variable, which we present in Table 7. Despite the well-known property that including a lagged dependent variable downwardly biases other coefficients in the presence of even mild serial correlation, we observe a positive and significant effect for all 7 models, though with a slightly diminished magnitude as compared to Table 6. However, the magnitude of the effect is slightly diminished. For example, in specification 2 the effects for petitions from the previous two congresses are roughly half of the estimates from Table 6.

To the extent that committee formation was a dynamic process, where past formation of committees and past petitioning mattered for future decisions about committee formation, we want our empirical model to account for such dynamics without severely biasing the estimates. Including a lagged dependent variable violates strict exogeneity, since it includes a right hand side variable that correlates with lags of the error term. One alternative approach, due to Arellano and Bond (1991), differences the data and then uses historical lags of the dependent variable as instruments for the differenced dependent variable from the current time period.

Table 8 presents results from this procedure. We estimate the effects for varying numbers of lags (10, 20, 30) used as instruments.[27] These results are generally in line with what we found previously, though the effect sizes are somewhat diminished.

[27]In each case, we cannot reject the null hypothesis that the over-identifying restrictions are valid through the Sargan test.

Table 7 – Dynamic Panel Model: Log-log regressions of standing committees upon petitions, by topic and congress, 1st through 43rd Congresses. Topics Paired With Multiple Committees

	All					1st-36th Congresses	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\ln(Committees_{t-1})$	0.903***	0.900***	0.899***	0.894***	0.914***	0.882***	0.877***
	(0.013)	(0.014)	(0.012)	(0.014)	(0.016)	(0.017)	(0.020)
$\ln(Petitions)$	0.021***	0.015*	0.016**	0.020*	0.016*	0.023***	0.025*
	(0.005)	(0.007)	(0.007)	(0.010)	(0.009)	(0.007)	(0.012)
$\ln(Petitions_{t-1})$		0.013**	0.009	0.007	0.007	0.006	0.007*
		(0.006)	(0.006)	(0.004)	(0.005)	(0.003)	(0.004)
$\ln(Petitions_{t-2})$		-0.000					
		(0.007)					
$\ln(Petitions_{t-3})$		-0.003					
		(0.006)					
$\ln(Petitions_{t-4})$		-0.002					
		(0.006)					
$\ln(Petitions_{t-5})$		-0.004					
		(0.005)					
$\ln(PresMessage)$			-0.003	-0.002	-0.002		-0.003
			(0.003)	(0.003)	(0.002)		(0.003)
Entropy				-0.010	-0.005		-0.006
				(0.014)	(0.014)		(0.014)
Share Newspaper Articles On Topic					-1.232		
					(1.498)		
Constant	0.052***	0.061***	0.054***	0.074***	0.069*	0.040***	0.064***
	(0.010)	(0.012)	(0.012)	(0.021)	(0.035)	(0.012)	(0.021)
Topic FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	714	646	714	589	481	578	466

Standard errors in parentheses
Standard Errors clustered at topic level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8 – Arellano-Bond Estimation of Effect of standing committees upon petitions, by topic and congress, 1st through 43rd Congresses.

	Topic Paired w/ One Committee			Topic Paired w/ Mult. Committees		
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(Petitions)$	0.012**	0.013**	0.014**	0.010	0.013*	0.014*
	(0.005)	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)
$\ln(Petitions_{t-1})$	-0.000	0.001	0.001	0.004	0.006	0.007
	(0.005)	(0.006)	(0.006)	(0.007)	(0.008)	(0.008)
$\ln(Committees\ (Primary)_{t-1})$	0.808***	0.850***	0.821***	0.811***	0.853***	0.782***
	(0.042)	(0.072)	(0.173)	(0.033)	(0.089)	(0.207)
Constant	0.093***	0.063	0.073	0.152***	0.100	0.156
	(0.024)	(0.041)	(0.095)	(0.030)	(0.075)	(0.170)
Observations	714	714	714	714	714	714
Sargan	115.813	53.899	9.245	97.043	36.442	5.391
Lags (Instrument)	10	20	30	10	20	30

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

8.1.1 Geographic Spread / Entropy of Petitions and Committee Formation

Beyond the volume of petitions, our formal model also predicted a link between the geographic entropy of petitions and committee formation. That is, as the geographic entropy of the petitions received increases, so too should the likelihood of committee formation. The first way we assess this prediction is by including a measure of geographic entropy within topics. Here, because we lack fine-grained data on the geographic origins of some petitions, we code petitions by state and use variation across states to construct the entropy measure, $S_t = -\sum_i p_{it} \cdot log(p_{it})$ with p_{it} representing the share of petitions from a given state for a Congress; a lower value means petitions on a topic originated from fewer places. In general, an entropy score S_t takes on a higher value when the geographic spread of petitions is more dispersed, and it takes on a lower value when the geographic spread of petitions is more concentrated.

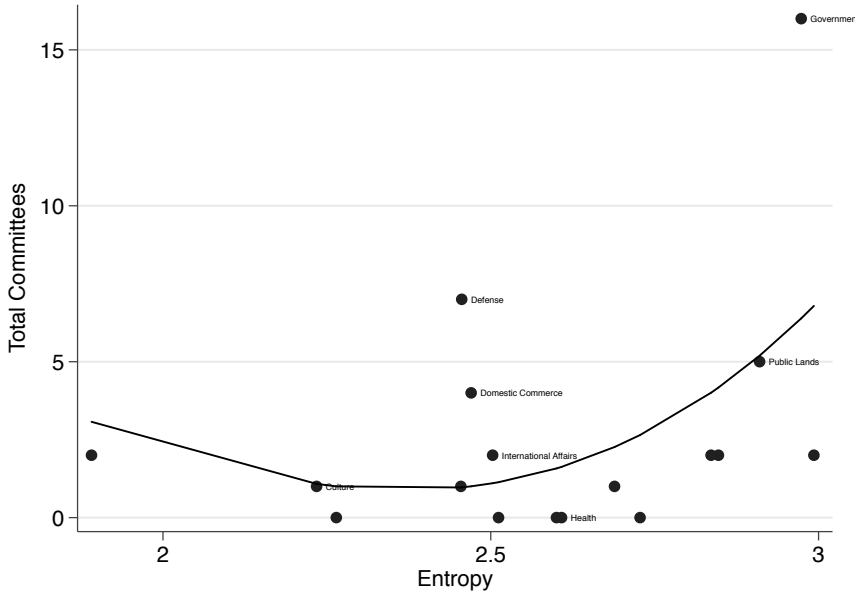
We included this variable in our primary estimation framework in Table 6. In contrast to the results with the volume of petitions, we do not find strong evidence of an increase in the formation of committees based on higher levels of entropy, at least in this estimation framework.

We also calculated entropy scores for each of the seventeen topic categories in the aggregate (i.e., collapsing across time). Figure A.3 in the Appendix displays the aggregate entropy scores by topic. Topics with the highest entropy scores include Government Operations, Public Lands, Transportation, Law and Crime, and Defense. Health, Immigration, and Technology had the lowest entropy scores (i.e., petitions were most concentrated in a limited set of geographic areas).

Figure 8 plots the number of total committees created that are related to a topic area against the entropy score. The relationship appears close to exponential: as the entropy score increases the number of committees increases markedly. The aggregate, graphical evidence is in line with our hypothesis.

Examining over time variation in committee formation as a function of entropy also squares with our hypothesis, for the most part. Figures A.4 and A.5 in the Appendix display graphical depictions of the relationship between entropy and committee formation over time. We plot entropy over time, and use vertical, dotted lines to indicate a year in which a new committee formed related to a given topic. We found that breaking out entropy scores by year was not ideal because some topics had no petitions for a given year, making the entropy measure sensitive to the number of

Figure 8 – Committee Formation and Geographic Spread (Entropy) of Petitions



petitions sent. However, conditional on receiving petitions, we observe that in many instances committees formed at, or immediately after, moments of high levels of geographic dispersion in petitions for a given topic. For example, the topics "'Defense" and "Government Operations" had consistently high levels of entropy and also had a number of committees form. On the other hand, a topic such as "Transportation" experienced more over-time variation in entropy, rising from an entropy score under 2 pre-1830s to an entropy score of close to 3. Only at this point did we begin to observe the creation of committees to deal with the requests submitted by petition that were related to transportation. Similarly, most committees linked to "Public Lands" formed at either local or global peaks in entropy. This was also true for "Law and Crime," "Civil Rights," and "Domestic Commerce."

Overall, we observe mixed evidence consistent with our hypothesis that geographic entropy in the submission of petitions is related to the formation of congressional committees. When looking at the creation of committees over time in a regression framework, we do not have definitive evidence in favor of the geographic entropy hypothesis. However, examining graphically topic by topic over time, committee formation occurs more often than not at local or global maximums in entropy for topics that do observe considerable variation in entropy. Other topics, that observe constant but consistently high levels of entropy, also have many committee formations. Collapsing across

time and looking at a cross section of topics, we also observed a positive (exponential) relationship between the geographic entropy of petitions and committee formation. Those topics with the most associated committees also received petitions with the broadest geographic spread.

8.2 Commerce and Manufactures: A Case Study

The empirical results reported thus far on petitioning in the U.S. House have relied on aggregate data over broad periods of time. However, focusing narrowly on the historical development of a single committee also yields evidence consistent with our central hypothesis.

In its various incarnations, the commerce committee of the U.S. House has functioned as one of its most important agents in American economic and political history.[28] A range of highly consequential federal programs and agencies was born in legislation produced from this committee, which also oversaw those programs and agencies. These include the Interstate Commerce Act of 1887 (creating the first independent regulatory commission, the Interstate Commerce Commission), the Federal Trade Commission Act of 1913 (creating the FTC), the Food, Drug and Cosmetic Act of 1938 (creating the modern FDA), and the Clean Air Act of 1970, among many others.

The House created the Committee on Manufactures and Commerce in 1795, yet in what amounts to the first major splitting of committee jurisdictions in American domestic policy, the House divided the two topics between two committees in 1819.[29]

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[28] From the Committee on Commerce and Manufactures (created in December 1795), the committee became the Commerce Committee in 1819 and then the Committee on Interstate and Foreign Commerce in 1891, a title which it kept until it became the Energy and Commerce Committee in 1985.

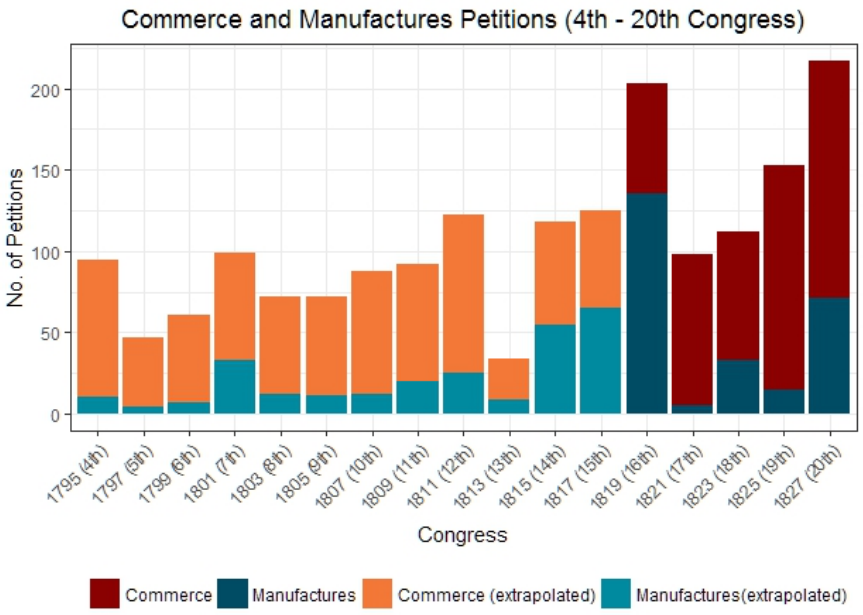
[29] Notably, the first call for such a split that we could find in the House Journal and Annals of Congress came in the form of a petition. On December 11, 1815, a petition of "a committee of sundry citizens of Philadelphia, concerned in various manufacturing establishments" was presented, "praying that a standing committee may be appointed, 'whose province and duty it shall be to watch over the interests of our manufacturing citizens, there not appearing to the memorialists any propriety in the reference of the subjects of Commerce and Manufactures to the same

What led to this split? A fuller investigation would require a paper, but as an initial inquiry into the role of petitions, we examined whether the mix of petitions related to themes of "commerce" and "manufacturing" changed in the early American republic.

We used the petition assignments to committees during the two-committee period (16th - 43rd) to train ensemble classifiers to distinguish between commerce-themed and manufacturing-themed petitions. Precision and recall numbers suggest that the models seem to be working well.[30] We then used the classifiers to code the petitions that were referred to the Committee on Commerce and Manufactures (4th - 15th Congress).

The data, illustrated in Figure 9, reveal a fairly dramatic increase for the manufacturing category before the committee split. The 15th Congress marks the first time since the creation of the Committee on Commerce and Manufactures that there were more manufactures than commerce petitions.

Figure 9 – Changes in Composition of Petitions and the Split of Commerce and Manufactures



committee'." Alas, after referral to the Rules Committee, we were unable to further track this petition.

[30] Precision statistics were 0.97 for the Commerce category and 0.95 for the Manufactures category. Recall statistics were 0.99 and 0.77, respectively.

In terms of our theoretical framework, the pre-1819 committee configuration represented a committee placed between topics of "commerce" and "manufacturing." Yet with the increase of petitions for the manufacturing topic, the relative net benefits of a two-committee configuration grew. Under the naïve assumption that the House weighted petitions equally, the passage of the ratio of manufacturing to commerce petitions across the barrier of one would represent a highly plausible action trigger.[31]

Congressional discussion as reported in the Annals of Congress supports our data further. Originally submitted by Peter Little (DR-MD), by the 16th Congress a four-term Congressman, the consideration to split the committee was opposed by the Thomas Newton, Jr. (DR-VA), who had been the chairman of the committee since the 10th Congress. Declaring that, in his opinion, the "two subjects had heretofore [...] been properly blended," Newton inquired why they should now be split. In defense of his proposition Little responded that "the subject of manufactures was one of leading importance, and which engrossed much of the attention of the country; that it was not necessarily connected with commerce, their interests being, indeed, frequently at variance; and that the subject was certainly of sufficient magnitude to occupy, of itself, the undivided attention of one committee." After some back-and-forth a third member, James Smith (DR-NC), chimed in that "it was too obvious to be denied, that the separation of two great subjects, and assigning them to different committees, would give to the consideration of both more precision and maturity, as well as greater despatch [sic]." The controversial motion then came to a vote and was affirmed 88-60. Perhaps unsurprisingly, one of the first members named to the newly created Committee of Manufactures was Peter Little of Maryland.

9 Conclusion

Petitions inundated early American legislatures but figure little in scholarly accounts of the development of these chambers. Petitions anticipated committee development not so much in the aggregate as in specific topics, the themes of citizen discontent or aspiration to which they gave voice. Our argument centers on the varied ways that emerging legislatures could deal with pe-

[31] In a dynamic model of allocation, there might be option value considerations that would move the cutpoint away from one.

titions – by disposition on the Floor itself, by assignment to a select committee without durable jurisdiction, by individual ombudsmanship, or by referral to a standing committee. Petitions generated new committees when they exhibited *topical specificity* and *geographic generality* – when they arrived on particular topics for which the legislature had no expertise, but where the topics were sufficiently geographically dispersed so that reference to representatives of local constituency was clearly inefficient or inappropriate.

Due in part to data constraints, and in part to scholars' focus upon bills and voting, the deep link between petitions and the formation of standing committee systems has not heretofore attracted the attention it deserves. We do not argue here that this relative neglect necessarily implies in any way a mis-specification of theory or empirical relationships. We are not in any position to make such a claim, and we surmise that petitions are as likely to "fit into" existing theories as a conditioning factor as they are to point to factors not yet considered. Nonetheless, the origins of committees in legislatures long predate many of the institutional developments that play key roles in prevailing theories of how congressional committees function. Our account links the formation of committees to concurrent events in early legislatures – specifically, we provide both a theoretical account of and empirical support for the case that petitions played an instrumental role in how and why committees formed in state and national legislatures.

Our theory of the development of committees explicitly accounts for the vast and varied inflow of petitions to legislatures at precisely the time when committees were developing. Our model makes several key predictions. We predict that the formation of a committee to deal with a given topic is a positive function of the inflow of petitions on that topic as well as a positive function of the geographic spread or entropy of petitions. The theory is at present decision-theoretic – early committees were created by the floor and by the floor alone – yet rich theoretical progress will be made, we think, when more dynamic and strategic considerations are explicitly theorized.

Our empirical analysis examines the very first committees created by the Virginia House of Delegates, using original data on the petitions sent to that chamber after the Declaration of Independence in the fall of 1776. We further examine the development of standing committees in the U.S. House of Representatives by gathering and analyzing a large, original dataset of over 100,000 petitions sent to the U.S. House from the First through Forth-Third Congresses, combined with analysis of related standing committee data. Our findings suggest that mass arrival of petitions

in a given topic was indeed a forerunner of standing committee creation in that general thematic area, and that the geographic spread of petitions was also positively linked to the formation of standing committee. These predictions could easily be applied to other emerging legislatures in the American context (Squire 2012) or in a comparative historical context. What testing these accounts requires is granular data on the petitions themselves, both the subjects they represent and the constituencies from which they flow.

What do these patterns mean for theories of legislative organization and accounts of institutional development in early legislatures? Petitions represented, we think, much more than "workload" (so too did bills represent more than "business"). They represented informative constituency claims, both identifying problems for discussion and solution and proposing particular solutions for consideration by the Committee of the Whole. They also represented information – lots of it, in fact – conveyed in statistics, in narrative and testimonials, in accounts of monies lost, in maps and projections. And increasingly in the nineteenth century and into the twentieth century, as petitions were accompanied ever more readily by mass signatory lists, they conveyed political information, signals to the legislature of the size (or growth in the size) of an issue-specific constituency and some of the more notable members of those nascent groups.

Finally, given that a rich literature in legislative politics examines jurisdiction and the various contests of jurisdictional assignments among members and among committees (Krehbiel 1992; King 1997; Esterling 2009; Cox and McCubbins 2005, 2007), the evolution of congressional petitioning points to the inherent difficulty in defining an issue in the first place. How do a set of issues, a set of arguments, a set of constituencies "add up to" a jurisdiction? How would legislators be able to characterize the mapping? How would they learn about it? What would be the costs of error or of inefficiency? It strikes us that in this area, more than in any other, petitions may have given both policy and ideological cues to early American legislators, about which issues traveled with other issues and which issues attached to which constituencies. It remains, finally, a dogged fact of the American Revolution, the early Republic and the antebellum period that legislators perceived their body's obligation as one of responding to petitions with equity. Petition consideration and committee formation may have represented electoral incentives, but they may also have stemmed from legislators' normative response to what they perceived as obligations of their chamber. What "Candidus" described of petitions in the First Congress might have been said of general antebellum

expectations for how legislative behavior would be shaped by public opinion as expressed through petitions and other instruments.

> In order to gain the confidence of the people they must be fully convinced that their memorials and petitions will be duly attended to when they are not directly repugnant to the interest and welfare of the community. And better would it be for government, to expend 100 dollars in an attempt to do justice to a man, or body of men, than for them to defraud either of them of 10 dollars by a direct refusal of justice.

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Appendix: Supporting Information for *Petitions and Legislative Committee Formation: Theory and Evidence from Revolutionary Virginia and the Early U.S. House*

A.1 Proofs

Proof of Lemma 1. We begin with a single committee and two topics and build results inductively from this case. For any topic $\tau_i(\hat{\lambda}_i)$, the losses (L) from a committee placed at distance $\alpha(\tau_i, c_j)$ are multiplicative, such that $L(\tau_i, c^*{}_j) = \hat{\lambda}_i^{\tau}\alpha(\tau_i, c_j)$. More generally,

$$L(\tau_i, c_j) = \int_{\tau_i}^{c_j} \lambda_i dz = \int_0^{\alpha(\tau_i, c_j)} \lambda_i dz \tag{9}$$

Now suppose that between any two topics $\tau_1(\hat{\lambda}_1)$ and $\tau_2(\hat{\lambda}_2)$, the floor seeks to create a committee that minimizes the sum of two information losses, that is (using the scalar representation of the loss function and the fact that constants of integration are ignorable in the infimum operator)

$$\inf L(\tau_i, c_j) = \inf\left(\int_{\tau_1}^{c_1} \lambda_1 dz + \int_{c_1}^{\tau_2} \lambda_2 dz\right) = \inf(c_1 - \tau_1)\lambda_1 + (\tau_2 - c_1)\lambda_2 \tag{10}$$

Using a linear projection of the topic arc, the committee placement that minimizes these losses is the placement that makes the committee indifferent between the demands coming from τ_1 and those from τ_2, which is equivalent to balancing the mass of topic-demand losses on either side of the committee, such that

$$c_1^* = \frac{\tau_1\lambda_1 + \tau_2\lambda_2}{\lambda_1 + \lambda_2} \tag{11}$$

Equivalently we can demonstrate optimal committee placement using an angular representation of the Poisson process. Let $h_i(\lambda^{\tau_i}) = w\lambda^{\tau_i}$, where $w \in \Re^{++}$ is finite. Let losses be generated by a "tent" utility function (as in Figure 3). (We hereafter use the *inverse stereographic projection* which maps the half-circle as a line and the rays as linear extensions from the points τ_1 and τ_2.) For any topic τ_i, the slope of the loss function as the committee gets further from the topic is given by the angle λ^{τ}. Since $0 < \lambda^{\tau} < \infty, \forall\tau_i$, the slope can be represented geometrically, such that, for instance, $\lambda^{\tau} = 1$ corresponds to a slope of the 45-degree angle, $\lambda^{\tau} = 2$ corresponds to a 60-degree angle, and so on. Then accumulated losses from committee placement at c_j are given by double the area of the right-angle triangle connecting the points (τ_i, c_j, β_i), where β_i is the point on the tent loss function for τ_i intersected by a vertical ray extending from the committee point c_j. Let the height of the right-angle triangle (the distance between c_j and β_i) be $h_i(\lambda^{\tau_i})$. (Because the angular representations of λ^{τ_i} are scalar (or even unit) multiples of λ^{τ_i} itself, the two solution methods in

(11) and (13) are identical.) Then total losses are $h_i(\lambda^{\tau_i})(c_j - \tau_i)$, and the Floor seeks to perform the following optimization between two committees

$$\begin{aligned} \inf L(\tau_i, c_j) = \inf \left(\int_{\tau_1}^{c_1} h_1(\lambda^{\tau_1}) dz + \int_{c_1}^{\tau_2} h_2(\lambda^{\tau_2}) dz \right) = \\ \inf (c_1 - \tau_1) h_1(\lambda^{\tau_1}) + (\tau_2 - c_1) h_2(\lambda^{\tau_2}) \end{aligned} \tag{12}$$

Because tent utility functions are monotonic and unidirectional, first-order conditions are sufficient for optimization, and between any two topics τ_1 and τ_2, the Floor places c_1 so as to

$$\begin{aligned} \inf L(\tau_i, c_j) = \inf \left(\int_{\tau_1}^{c_1} h_1(\lambda^{\tau_1}) dz + \int_{c_1}^{\tau_2} h_2(\lambda^{\tau_2}) dz \right) = \\ \inf (c_1 - \tau_1) h_1(\lambda^{\tau_1}) + (\tau_2 - c_1) h_2(\lambda^{\tau_2}) \\ \iff \frac{d}{dc} (c_1 - \tau_1) h_1(\lambda^{\tau_1}) + (\tau_2 - c_1) h_2(\lambda^{\tau_2}) = 0 \\ \iff h_1(\lambda^{\tau_1}) - h_2(\lambda^{\tau_2}) = 0 \iff h_1(\lambda^{\tau_1}) = h_2(\lambda^{\tau_2}) \end{aligned} \tag{13}$$

Between τ_1 and τ_2, the functional heights $h_1(\lambda^{\tau_1})$ and $h_2(\lambda^{\tau_2})$ can only have equality when they share a common β ($\beta_1 = \beta_2 \equiv \beta^*$), which is given by the unique intersection of the rays of the loss functions (see Figure 3). Hence optimal committee placement occurs at the point on the circle where the unique line (perpendicular to the tangent at the committee placement point) extends to β^*. Because the loss functions are monotonic, and because the λ^{τ_1} ray is strictly increasing in z while the λ^{τ_2} ray is strictly decreasing in z, there exists a single intersection and uniqueness of c_1^* and β^* follows.

For the equivalence of the "balancing" and "angular" solution methods, note that the angular rays meet at the point β^*, whose distance from the circle ν is given by $\nu^* = \nu_1 = \nu_2 \implies (z - \tau_1)\lambda^{\tau_1} = (\tau_2 - z)\lambda^{\tau_1} \implies z = \frac{\tau_1 \lambda_1 + \tau_2 \lambda_2}{\lambda_1 + \lambda_2}$, or (11).

The Case of $N_c = N_\tau$. For two committees and two topics, the solution is simple, namely that each committee is placed exactly at the topic point. This extends easily to any number of committees and topics, hence the number of committees will never be larger than the number of topics (this result is eased by the assumption that committee placement upon a topic is sufficient to eliminate losses from that topic, no matter what the "flow" (λ^{τ_i}) may be).

Topic-Averaging. We then consider the case of three topics and one committee situated somewhere between them, as in Figure A-1. For this case, we demonstrate the universality of a *topic-averaging* operation, as follows. For any possible committee to one side of two topics τ_1 and τ_2, the two topics may be averaged by constructing an "averaged" topic $\tilde{\tau}_{1,2}$ with averaged location

equal to the hypothetical placement of $c*_1$ between τ_1 and τ_2 given by (13), and with slope of loss function equal to $\lambda^{\tau_1} + \lambda^{\tau_2}$.

Because any finite sum of λ^{τ_i} is itself finite, the tent utility function of the averaged topics is monotonic and unidirectional, first-order conditions are again sufficient for optimization, and among any three topics τ_1, τ_2 and τ_3, the Floor places c_1 so as to

$$\begin{aligned}
&\inf L(\tau_i, c_j) \\
&= \inf \left(\int_{\tau_1}^{c_1} h_1(\lambda^{\tau_1}) dz + \int_{c_1}^{\tau_2} h_2(\lambda^{\tau_2}) dz + \int_{c_1}^{\tau_3} h_3(\lambda^{\tau_3}) dz \right) \\
&= \inf L(\tau_i, c_j) = \inf \left(\int_{\tau_1}^{c_1} h_1(\lambda^{\tau_1}) dz + \int_{c_1}^{\tilde{\tau}_{2,3}} h_{2,3}(\lambda^{\tilde{\tau}_{2,3}}) dz \right) \\
&= \inf (c_1 - \tau_1) h_1(\lambda^{\tau_1}) + (\tilde{\tau}_{2,3} - c_1) h_{2,3}(\lambda^{\tilde{\tau}_{2,3}}) \\
&\iff \frac{d}{dc}(c_1 - \tau_1) h_1(\lambda^{\tau_1}) + (\tilde{\tau}_{2,3} - c_1) h_{2,3}(\lambda^{\tilde{\tau}_{2,3}}) = 0 \\
&\iff h_1(\lambda^{\tau_1}) - h_{2,3}(\lambda^{\tilde{\tau}_{2,3}}) = 0 \iff h_1(\lambda^{\tau_1}) = h_{2,3}(\lambda^{\tilde{\tau}_{2,3}})
\end{aligned} \tag{14}$$

Because τ_1, τ_2 and τ_3 are arbitrary, topic averaging can thus be applied to any two or more topics. By extension from (14), any N_τ-topic problem ($N_\tau > 2$) for one committee can always be reduced to a two-topic problem with topic-averaging and solved via (14). By the conditions associated with (13), this solution is again unique.

By induction, a two-committee problem with three topics can be solved either by placement of one committee on an outermost topic plus application of (13) for the other two topics, or by positioning the two committees strictly between each of the pairs of topics and solving by joint application of (13). By induction, and by the fact than an topic-averaged loss function has monotonicity, (13) and (14) can be repeatedly applied to create a unique solution for any (N_c, N_τ) problem with $N_c < N_\tau$.

Finally, existence is given by invoking the convexity of the infimum. Let $\Lambda = \sum_{i=1}^{N_\tau} \lambda^{\tau_i}$ Then

$$\begin{aligned}\forall\tau_i, c_j, \exists!\inf L(\tau_i, c_j) = \inf\left((c_j - \tau_i)\lambda^{\tau_i} + (\tau_{i+1} - c_j)\lambda^{\tau_{i+1}}\right) \implies \\ \exists!\inf\left((c_j - \tau_i)\frac{\lambda^{\tau_i}}{\Lambda} + (\tau_{i+1} - c_j)\frac{\lambda^{\tau_{i+1}}}{\Lambda}\right) \\ \implies \\ \exists!\inf_{j\in\mathcal{C}}\sum\frac{\hat{\lambda}^{\tau_i}}{\Lambda}\alpha(\tau_i, c_j) \implies \\ \exists!\inf_{j\in\mathcal{C}}\sum_{\tau=1}^{N_\tau}\hat{\lambda}_i^{\tau} d[(x_i^{\tau}, y_i^{\tau}), (x_j^{c}, y_j^{c})]\end{aligned} \tag{15}$$

QED.

Proof of Lemma 2. The "cheap" version of the proof simply recognizes that, when $N_c = N_\tau$ and ever after, $L^c_{N_{c+1}} - L^c_{N_c} = 0$. Hence the series is always weakly decreasing after $L^c_{(N_c=N_{\tau-1})}$.

For a proof more informative as to the optimum policy, note that the informational losses that would have been incurred by the Floor's processing no longer enter the computation of the series $L^c_{N_{c+1}} - L^c_{N_c}$ after the addition of the first committee. For the symmetric topic circle, there are no committees if $\sum^{N_\tau} r\hat{\lambda}^{\tau} < \sum^{N_\tau}\hat{\lambda}^{\tau}\inf d[\tau, c_1]$, hence the realized benefit of the first committee over universal Floor disposition is

$$\sum^{N_\tau}\hat{\lambda}^{\tau}\inf d[\tau, c_1] + k_c - \sum^{N_\tau} r\hat{\lambda}^{\tau} \tag{16}$$

Given a known cost-function $k_c(N_c)$, it therefore suffices for analysis of the series $L^c_{N_{c+1}} - L^c_{N_c}$ to focus only upon the change in informational losses from one committee system to the next, or

$$\Delta L(N_c) = L(N_{c+1}) - L(N_c) = \sum_{i\in\mathcal{C}(N_{c+1})}\hat{\lambda}_i^{\tau}\times d[(x_i^{\tau}, y_i^{\tau}), (x_j^{c^*}, y_j^{c^*})] - \sum_{i\in\mathcal{C}(N_c)}\hat{\lambda}_i^{\tau}\times d[(x_i^{\tau}, y_i^{\tau}), (x_j^{c^*}, y_j^{c^*})] \tag{17}$$

We build by induction from the three topic, one-committee case. For three topics and one committee, with committee placement according to (14), informational losses are

$$L(N_c = 1) = \lambda_1(\tau_1 - c_1) + \lambda_2(\tau_2 - c_1) + \lambda_3(\tau_3 - c_1)$$

and for a two-committee system (where the location of c_1 may change, hence called c_1'), at least one of the topics is now closer to c_2 than to c_1', which renders

$$L(N_c = 2) = \lambda_1(\tau_1 - c_1') + \lambda_2(\tau_2 - c_2) + \lambda_3\times\inf(\tau_3 - c_1, \tau_3 - c_2)$$

hence the differential is

$$\Delta L(N_2 - N_1 | N_\tau = 3) = \lambda_1 \left((\tau_1 - c_1') - (\tau_1 - c_1) \right) + \lambda_2 \left((\tau_2 - c_1) - (\tau_2 - c_2) \right) + \lambda_3 \left((\tau_3 - c_1) - \inf(\tau_3 - c_1, \tau_3 - c_2) \right)$$

From this exercise, we can see that a generalization of the differential of informational losses incurred by adding a committee to a system of N_c committees contains three sets of terms. First, every new committee system potentially repositions existing committees, changing the informational losses in the set of pre-existing committees that remain the closest to the topics with which they were previously paired. Second, every time a committee is added, at least one topic is with certainty closer to the new committee than to its previous closest committee (we denote this by calling it the $(j+1)$th committee below, which is now closer than the (j)th committee to the ith topic). Third, the repositioning of committees with each marginal committee added induces a set of possible switches of topic-committees pairings, such that the Floor's informational losses for one topic under the previous committee system being compared against a new set of infima that are induced by the addition of a new committee

$$\begin{aligned} \Delta L = & \sum_{j \in \mathcal{C}(N_c), s.t.\, \inf_j (\tau_i - c_j') \to c_j' = c_j} \lambda_i \left((\tau_i - c_j') - (\tau_i - c_j) \right) \\ & + \sum_{j \in \mathcal{C}(N_c), s.t.\, \inf_j (\tau_i - c_j') \to c_{j+1}} \left(\lambda_i (\tau_i - c_j) - \lambda_i (\tau_i - c_{j+1}) \right) \\ + & \sum_{j \in \mathcal{C}(N_c), s.t.\, \inf_j (\tau_i - c_j') \to c_j' \neq c_j} \lambda_i \left(\inf(\tau_i - c_j', \tau_i - c_j') - \inf(\tau_i - c_j, \tau_i - c_j) \right) \end{aligned} \tag{18}$$

By construction of the topic circle and the finite character of λ_i, the set of informational losses is finite. But by equation (6)), ΔL is weakly negative $\forall N_c$, thus each of these three terms converges to zero, as does their sum. **QED**.

Proof of Hypothesis 2: *The probability of a committee being created near topic τ_i is a weakly increasing function of the petition rate $\hat{\lambda}(\tau_i)$*

On the topic circle, define a symmetric interval about τ_i by $[\tau_i - \gamma, \tau_i + \gamma]$, where γ is uniformly distributed on the domain $0 < \gamma < \pi, \forall \gamma, \tau_i$. We seek the $\Pr\left(c_1^* \in [\tau_i - \gamma, \tau_i + \gamma]\right)$.

Take first the one-committee, two-topic problem whose solution is given by (13). Again, because the functional heights $h_1(\lambda^{\tau_1})$ and $h_2(\lambda^{\tau_2})$ can only have equality when they share a common β ($\beta_1 = \beta_2 \equiv \beta^*$), then optimal committee placement occurs at the intersection of the minimum-distance line connecting the topic line to β^* (see Figure 2). Fix the topic points τ_1 and τ_2 and one of the Poisson intensities (for illustration, λ^{τ_1}, leaving λ^{τ_2} for comparative statics). The optimum placement of c_1 creates a right triangle $B(c_1^*)$ with points (c_1^*, τ_2, β^*), with right-angle at c_1^* and

angles $A(\tau_2)$ and $A(\beta^*)$. By the right-triangularity of B, $A(\tau_2)$ and $A(\beta^*)$ are complementary. Let angular measure (radians) be denoted by ρ. Because $\frac{d[c_1^*-\tau_2]}{dA(\beta^*)} > 0$ and $\frac{dA(\beta^*)}{d\rho} = -\frac{dA(\tau_2)}{d\rho}$, then by implicit differentiation, $\frac{d[c_1^*-\tau_2]}{dA(\tau_2)} < 0$. But $\frac{dA(\tau_2)}{d\rho} = \lambda^{\tau_2}$. Then $\forall\gamma$, $\Pr\left(c_1^* \in [\tau_i - \gamma, \tau_i + \gamma]\right)$ is weakly decreasing (from 1 to 0, at least once) in $[c_1^* - \tau_2]$ which by implicit differentiation is strictly decreasing in λ^{τ_2}.

For any four or more topics, generate two topic-averaged points $\tilde{\tau}_{1,2}$ and $\tilde{\tau}_{3,4}$, and apply topic-averaged optimization in (14). Fix the points and the first averaged intensity $\lambda\left(\tilde{\tau}_{1,2}\right)$, leaving $\lambda\left(\tilde{\tau}_{3,4}\right)$ for comparative statics. By monotonicity of the angle $A\left(\tilde{\tau}_{3,4}\right)$ in $\lambda\left(\tilde{\tau}_{3,4}\right)$, $\Pr\left(c_1^* \in [\tilde{\tau}_{3,4} - \gamma, \tilde{\tau}_{3,4} + \gamma]\right)$ is weakly decreasing (from 1 to 0, at least once) in $[c_1^* - \tilde{\tau}_{3,4}]$ which by implicit differentiation is strictly decreasing in $\lambda^{\tilde{\tau}_{3,4}}$.

QED.

Proof of Hypothesis 3: *The probability of a committee being created near topic τ_i is a strictly increasing function of the entropy of the petitions' distribution across districts.*

With topic-specific petition intensities given by $\lambda^{\tau_i} = \lambda(\tau_i)$, rewrite the intensities as a sum of the intensities of district-specific intensities for all districts. Index districts by s, so that there are N_s districts, $2 < N_s < \infty$. Then each Poisson intensity can be written as

$$\lambda^{\tau_i} = \sum_{s=1}^{N_s} \lambda_s^{\tau_i} \tag{19}$$

Then for any topic, the proportion of petitions on that topic from district s' can be written as

$$p_{s'}^{\lambda^{\tau_i}} = \frac{\lambda_{s'}^{\tau_i}}{\sum_{s=1}^{N_s} \lambda_s^{\tau_i}} = \frac{\lambda_{s'}^{\tau_i}}{\lambda^{\tau_i}} \tag{20}$$

If we assume that members themselves are informed only about the petitions from their own district, then an ombudsman's or select committee's reduction of informational losses is only partial when all topic petitions are assigned to one person or to a select committee. (The idea here being that the ombudsman's or select committee's knowledge comes not from continuous specialization and experience, but from local-level knowledge gained from having lived in, and having come to the legislature from, a given district.) Assigning all petitions (or the entire topic) to a single member (ombudsman strategy, for district s_1) yields informational losses of $(1 - p_{s_1}^{\lambda^{\tau_i}})\lambda^{\tau_i}$. For two members, the informational losses are $(1 - (p_{s_1}^{\lambda^{\tau_i}} + p_{s_2}^{\lambda^{\tau_i}}))\lambda^{\tau_i}$, and then for any subset (marked by Υ) of districts from which a select committee is created, informational losses from topic assignment to the relevant select committee are

$$1 - \sum_{s \in \Upsilon} p_{s_1}^{\lambda^{\tau_i}} \lambda^{\tau_i} \tag{21}$$

Let the cost of each select committee or ombudsman referral be given by $k_\upsilon > 0$. Then for any given topic, the floor chooses the ombudsman strategy over the standing committee if

$$\left(k_\upsilon + \left(1 - \sum_{s \in \Upsilon} p_{s_1}^{\lambda^{\tau_i}}\right)\right) \lambda^{\tau_i} < k_c + \inf_j (c_j - \tau_i) \lambda^{\tau_i} \tag{22}$$

The condition stated in (22) is rather conservatively stated, as it assumes that the relevant standing committee does not yet exist, and that in order for the topic to be handled, the costs of select committee creation must be borne in full by the Floor. This formal conservatism does not affect our hypothesis, however, which concerns the marginal effect of the concentration or entropy of petitions across districts. Note, too, that select committee or ombudsman referral is multiplied by the number of petitions ($\lambda(\tau_i)$, or equivalently the intensity of the topic) for which it is chosen as a strategy, whereas standing committee creation is assumed to be one-shot, after which topic referral is assumed to have zero marginal cost.

We assume that members of the set Υ are chosen so as to $\sup_{s \in \Upsilon} \sum_s p_s^{\lambda^{\tau_i}}$. As all topic petitions fall into district s', then $p_{s'}^{\lambda^{\tau_i}} \to 1$ and informational losses from ombudsman strategy are minimized. Correspondingly, the Shannon entropy measure is minimized, as $-\sum p_s^{\lambda^{\tau_i}} \ln(p_s^{\lambda^{\tau_i}}) \to 0$. In contrast, as topic petitions become uniformly distributed across districts ($\forall s, p_s^{\lambda^{\tau_i}} \to N_s^{-1}$), the Shannon entropy measure is maximized, as $-\sum p_s^{\lambda^{\tau_i}} \ln(p_s^{\lambda^{\tau_i}}) \to 1$. As $\frac{d(-\ln p_s^{\lambda^{\tau_i}})}{dp_s^{\lambda^{\tau_i}}} < 0$ the entropy measure is continuous and monotonically decreasing in $\sup_{s \in \Upsilon} \sum_s p_s^{\lambda^{\tau_i}}$. **QED**.

Proof of Hypothesis 4: For each τ_i, members from more petition-intense districts are more likely to be appointed to the standing committee nearest that topic.

Let $\mathcal{M}^c$ represent the subset of members (districts) chosen for a given committee. We adopt a simple representation for standing committee information losses as a function of members' "home expertise," as follows

$$L(c_j, \tau_i) = \lambda^{\tau_i} \left(\tau_i - \left(\psi \sum_{s \in \mathcal{M}^c} p_s^{\lambda^{\tau_i}}\right) c_j\right) \tag{23}$$

Thus committee placement at c_j minimizes $(\tau_i - c_j)$ iff $\psi \sum_{s \in \mathcal{M}^c} p_s^{\lambda^{\tau_i}} = 1$. For any pairwise comparison of members from districts s_1 and s_2, the Floor selects the second member if $p_2^{\lambda^{\tau_i}} > p_1^{\lambda^{\tau_i}}$. But s_1 and s_2 are arbitrary, and as $L(c_j, \tau_i)$ is monotonically declining in any member's district $p_s^{\lambda^{\tau_i}}$, the pairwise comparison has the associative property for all s. **QED**.

Tables & Figures

Table A.1 – Log-log regressions of standing committees upon petitions, by topic and congress, 1st through 43rd Congresses. Topics Paired with Only One Committee

	All					1st-36th Congresses	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ln(*Petitions*)	0.038	0.013	0.025*	0.030	0.026	0.044**	0.043
	(0.024)	(0.014)	(0.013)	(0.024)	(0.022)	(0.018)	(0.031)
ln($Petitions_{t-1}$)		0.013	0.022	0.012	0.003	0.034	0.015
		(0.010)	(0.017)	(0.019)	(0.018)	(0.023)	(0.026)
ln($Petitions_{t-2}$)		0.003					
		(0.008)					
ln($Petitions_{t-3}$)		0.009					
		(0.007)					
ln($Petitions_{t-4}$)		0.014*					
		(0.007)					
ln($Petitions_{t-5}$)		0.016					
		(0.018)					
ln(*PresMessage*)			-0.003	-0.005	-0.004		-0.009
			(0.009)	(0.009)	(0.010)		(0.008)
Entropy				-0.048	-0.039		-0.016
				(0.047)	(0.045)		(0.046)
Share Newspaper Articles On Topic					-6.417		
					(7.939)		
Constant	0.042	0.062	0.048	0.088	0.148	-0.025	-0.008
	(0.102)	(0.111)	(0.100)	(0.127)	(0.207)	(0.112)	(0.137)
Congress Time Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Topic FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	731	646	714	589	481	578	466

Standard errors in parentheses
Standard Errors clustered at topic level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A.1 – Petitions By Topic Received in House Over Time

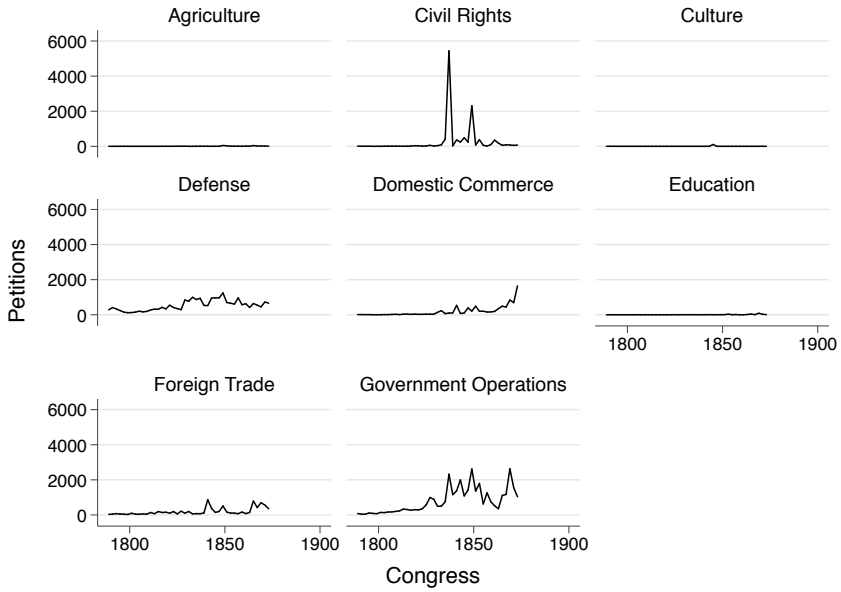


Figure A.2 – Petitions By Topic Received in House Over Time

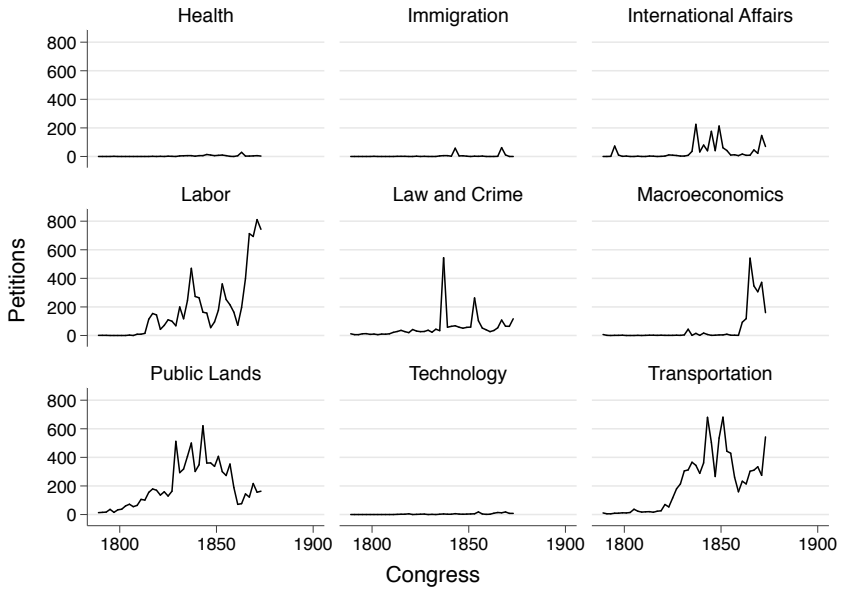


Figure A.3 – Geographic Spread (Entropy) of Petitions by Topic

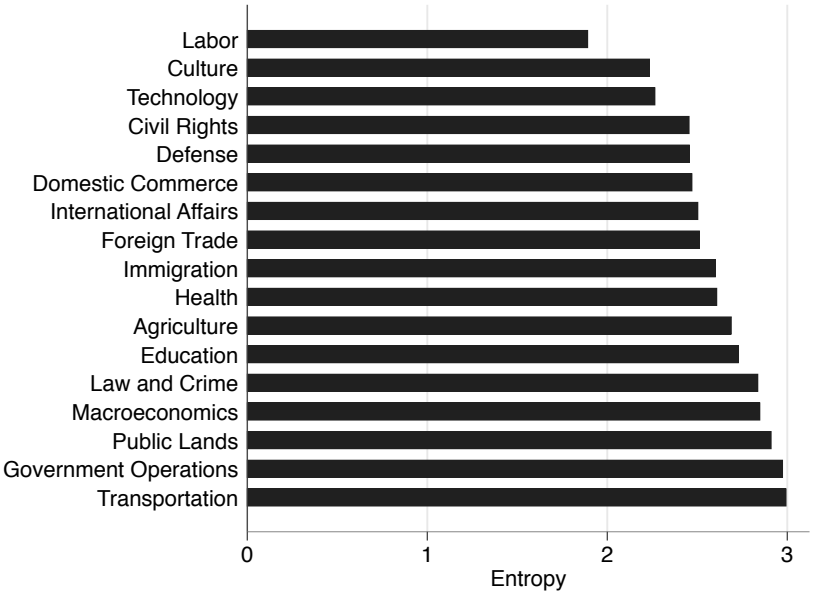


Figure A.4 – Geographic Spread (Entropy) of Petitions by Topic over Time

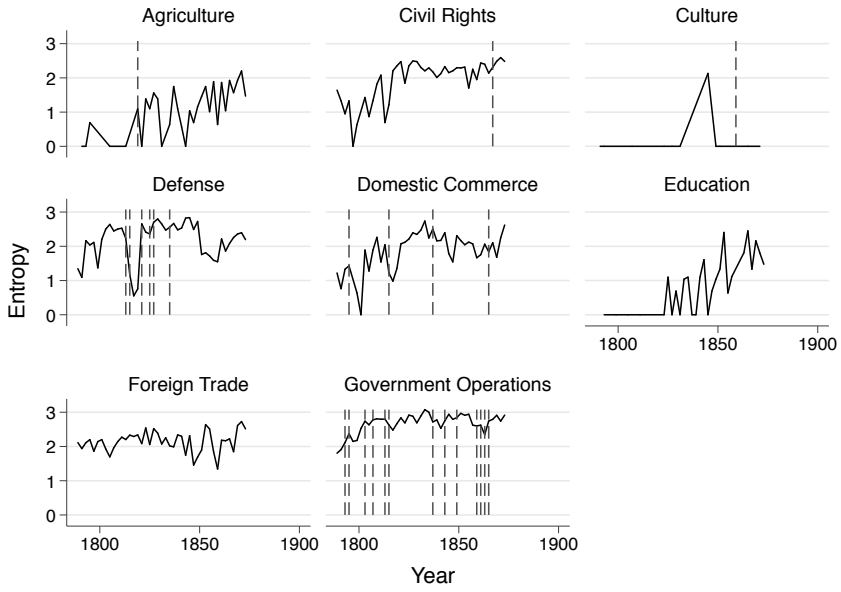
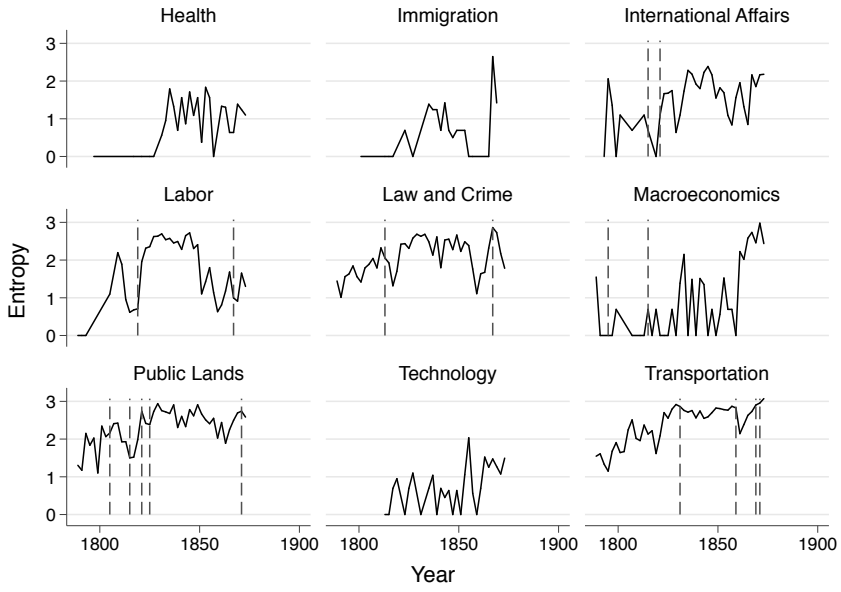


Figure A.5 – Geographic Spread (Entropy) of Petitions by Topic over Time



A.2 Supplementary Tables and Figures

Table A.2 – Comparing *Actual* vs. *Predicted* Petition Topics after Classification

	Dom. Comm.	Law/ Crime	Defense	Foreign Trade	Macro	Gov. Ops.	Culture	Ag.	Int. Affairs	Pub. Lands	Trans.	Civil Rights	Immig.	Educ.	Tech.	Health	Labor
Dom. Comm.	21	1	0	0	0	3	1	0	2	0	0	0	0	1	0	0	1
Law/Crime	0	6	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0
Defense	3	3	96	0	5	0	19	0	2	3	6	1	0	1	0	0	0
Foreign Trade	6	1	0	29	2	0	1	0	2	1	0	1	0	0	1	0	0
Gov. Ops.	6	4	8	2	122	3	1	2	4	4	5	5	1	3	0	2	0
Macro	0	0	0	1	2	5	0	0	0	0	0	0	1	0	0	0	0
Labor	1	0	3	0	1	0	7	0	0	0	0	0	0	0	0	0	0
Culture	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Ag.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Int. Affairs	1	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0
Pub. Lands	0	0	2	1	5	1	0	0	0	0	38	5	0	0	1	0	0
Trans.	1	0	0	0	2	0	1	0	1	1	11	36	0	0	0	0	0
Health	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Civil Rights	0	0	0	0	1	0	0	0	0	0	0	0	0	32	0	0	0
Immigration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Educ.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tech.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table A.3 – Matching of Petition Topics to Committees

Topic	Committee	Primary
Agriculture	Agriculture	1
Agriculture	Private Land Claims	0
Civil Rights	Freddman's Bureau	1
Civil Rights	Indian Affairs	0
Culture	Library	1
Defense	Claims	0
Defense	Expend., Navy	1
Defense	Expend., War	1
Defense	Invalid Pensions	1
Defense	Military Affairs	1
Defense	Military Pensions	1
Defense	Militia	1
Defense	Naval Affairs	1
Defense	Pensions and Revolutionary Claims	1
Defense	Revolutionary Claims	1
Defense	Revolutionary Pensions	0
Defense	War Claims	1
Domestic Commerce	Banking and Currency	1
Domestic Commerce	Commerce	1
Domestic Commerce	Commerce and Manufactures	1
Domestic Commerce	Expend., Public Buildings	1
Domestic Commerce	Manufactures	0
Domestic Commerce	Patents	1
Domestic Commerce	Railways and Canals	0
Domestic Commerce	Roads and Canals	0
Education	Education and Labor	0
Education	Library	0
Energy	Mines and Mining	1
Environment	Public Expenditures	0
Environment	Public Lands	0
Foreign Trade	Commerce	0
Foreign Trade	Commerce and Manufactures	0
Foreign Trade	Expend., State	0
Foreign Trade	Foreign Affairs	0
Foreign Trade	Indian Affairs	0
Government Operations	Accounts	1

Continued...

Topic	Committee	Primary
Government Operations	Appropriations	1
Government Operations	Civil Service	1
Government Operations	Claims	1
Government Operations	Coinage, Weights, and Measures	1
Government Operations	District of Columbia	1
Government Operations	Election of President and Vice President...	1
Government Operations	Elections	1
Government Operations	Engraving	1
Government Operations	Enrolled Bills	1
Government Operations	Expend., P.O.	1
Government Operations	Expend., Treasury	0
Government Operations	Mileage	1
Government Operations	Post Offices and Post Roads	1
Government Operations	Printing	1
Government Operations	Public Buildings and Grounds	1
Government Operations	Public Expenditures	1
Government Operations	Reform in the Civil Service	1
Government Operations	Revisal and Unfinished Business	1
Government Operations	Revisal of the Laws	0
Government Operations	Revolutionary Claims	0
Government Operations	Rules	1
Government Operations	War Claims	0
Health	Invalid Pensions	0
Health	Military Pensions	0
International Affairs	Expend., State	1
International Affairs	Foreign Affairs	1
International Affairs	Indian Affairs	0
Labor	Education and Labor	1
Labor	Invalid Pensions	0
Labor	Manufactures	1
Labor	Pensions and Revolutionary Claims	0
Labor	Reform in the Civil Service	0
Law and Crime	Judiciary	1
Law and Crime	Patents	0
Law and Crime	Pensions and Revolutionary Claims	0
Law and Crime	Revisal of the Laws	1
Law and Crime	Revolutionary Claims	0
Law and Crime	War Claims	0

Continued...

Topic	Committee	Primary
Macroeconomics	Banking and Currency	0
Macroeconomics	Commerce	0
Macroeconomics	Commerce and Manufactures	0
Macroeconomics	Expend., Treasury	1
Macroeconomics	Ways and Means	1
Public Lands	District of Columbia	0
Public Lands	Expend., Public Buildings	0
Public Lands	Indian Affairs	1
Public Lands	Mississippi Levees (renamed # 132)	1
Public Lands	Pacific Railroad	0
Public Lands	Post Offices and Post Roads	0
Public Lands	Private Land Claims	1
Public Lands	Public Buildings and Grounds	0
Public Lands	Public Lands	1
Public Lands	Roads and Canals	0
Public Lands	Territories	1
Social Welfare	Invalid Pensions	0
Social Welfare	Military Pensions	0
Social Welfare	Pensions and Revolutionary Claims	0
Social Welfare	Revolutionary Pensions	1
Technology	Patents	0
Transportation	Pacific Railroad	1
Transportation	Railways and Canals	1
Transportation	Roads and Canals	1

Table A.4 – Matching of Petition Topics to Committees

Topic	Committee
Petition Topic	Related Committee
CIVIL RIGHTS / SLAVERY	Freedman's Bureau
CLAIMS	Claims
CLAIMS	War Claims
CLAIMS	Private Land Claims
CLAIMS	Pension and Revolutionary Claims
CLAIMS	Revolutionary Claims
EXPENDITURES	Appropriations
EXPENDITURES	Expenditures
EXPENDITURES	Mileage
FINANCE / BANKING / ECONOMY	Coinage, Weights, and Measures
FINANCE / BANKING / ECONOMY	Commerce
FINANCE / BANKING / ECONOMY	Commerce and Manufactures
FINANCE / BANKING / ECONOMY	Accounts
FINANCE / BANKING / ECONOMY	Banking and Currency
FOREIGN AFFAIRS	Foreign Affairs
FOREIGN AFFAIRS	Immigration and Naturalization
FOREIGN AFFAIRS	Interstate and Foreign Commerce
INFRASTRUCTURE / TRANSPORTATION	Public Buildings and Grounds
INFRASTRUCTURE / TRANSPORTATION	Roads
INFRASTRUCTURE / TRANSPORTATION	Rivers and Harbors
INFRASTRUCTURE / TRANSPORTATION	Roads and Canals
INFRASTRUCTURE / TRANSPORTATION	Railways and Canals
INFRASTRUCTURE / TRANSPORTATION	Mississippi Levees
INFRASTRUCTURE / TRANSPORTATION	Pacific Railroad
INFRASTRUCTURE / TRANSPORTATION	Irrigation and Reclamation
INFRASTRUCTURE / TRANSPORTATION	Irrigation of Arid Lands
INFRASTRUCTURE / TRANSPORTATION	Levees and Improvements of the Miss. River
INFRASTRUCTURE / TRANSPORTATION	Flood Control
INFRASTRUCTURE / TRANSPORTATION	Post Offices and Post Roads
JUDICIARY	Judiciary
LABOR	Labor
LABOR	Education and Labor
LABOR	Education
LABOR	Manufactures
LABOR	Civil Service

Continued...

Topic	Committee
MILITARY / NAVY	Militia
MILITARY / NAVY	Military Affairs
MILITARY / NAVY	Merchant Marine and Fisheries
MILITARY / NAVY	Naval Affairs
PUBLIC LANDS / TERRITORIES	Territories
PUBLIC LANDS / TERRITORIES	Public Lands
REGULATION	Alcoholic Liquor Traffic
REGULATION	Revisal of the Laws
REGULATION	Patents
TARIFF / TAX	Ways and Means
PENSIONS	Pensions
PENSIONS	Invalid Pensions
PENSIONS	Military Pensions
PENSIONS	Revolutionary Pensions

Table A.5 – Log-log regressions of standing committees upon petitions, by topic and congress, 1st through 43rd Congresses. Alternative Topic Codings; Topics Paired with Only One Committee.

	All			1st-36th Congresses	
	(1)	(2)	(3)	(4)	(5)
ln(*Petitions*)	0.058**	0.056*	0.039	0.061*	0.049
	(0.026)	(0.027)	(0.030)	(0.029)	(0.033)
ln($Petitions_{t-1}$)	0.037*	0.045**	0.038	0.030	0.034
	(0.018)	(0.019)	(0.022)	(0.017)	(0.021)
ln($Petitions_{t-2}$)	0.002				
	(0.007)				
ln($Petitions_{t-3}$)	0.006				
	(0.009)				
ln($Petitions_{t-4}$)	0.006				
	(0.010)				
ln($Petitions_{t-5}$)	0.010				
	(0.019)				
Constant	-0.088	-0.116	-0.178	-0.139	-0.192
	(0.164)	(0.163)	(0.213)	(0.167)	(0.209)
Congress FEs	No	No	Yes	No	Yes
Congress Time Trend	Yes	Yes	No	Yes	No
Topic FEs	Yes	Yes	Yes	Yes	Yes
N	494.000	546.000	546.000	442.000	442.000

Standard errors in parentheses
Standard Errors clustered at topic level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$